Chemistry 1B: General Chemistry Section 01 and Section 02 Fall 2018

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Please note that e-mail is the most reliable way to get in touch with me outside of office hours
Course Webpage: Canvas
Office Hours: MW 9:30 am – 10:30 am and 5:20 – 6:20 pm *and by appointment*
Class Meetings
Lecture: MWF 9:30 am – 10:20 am, SC1102
Lab Section 01: MW 11:30 am – 2:20 pm, SC2204
Lab Section 02: MW 2:30 pm – 5:20 pm, SC2204

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.

Course Description
Chemistry 1B is the second quarter of a year-long introduction to the principles of general chemistry, and a direct continuation from Chemistry 1A. Chemistry 1B will constitute an investigation of intermolecular forces and their effects on chemical and physical properties, investigation of reversible reactions from the standpoints of kinetics, thermodynamics, and equilibrium, as well as investigation and application of gas laws and kinetic molecular theory.

Prerequisites
Chemistry 1A with a grade of C or better. EWRT 211 and READ 211 (or LART 211), or ESL 272 and 273.

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.

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.
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 1B laboratory manual, available online on the course Canvas webpage.
4. A dedicated bound composition notebook to use as a laboratory notebook.
5. Approved laboratory safety goggles (not safety glasses), available from the De Anza College Bookstore. Safety goggles must be ANSI-rated.
6. Stapler and staples.
7. A thumb/flash drive to save and transfer assignments from the lab computers.

Recommended
8. *Calculations in Chemistry an Introduction*, 2nd edition by Dahm and Nelson.
9. Disposable latex or nitrile gloves.

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 topics that are unfamiliar.
2. Take *handwritten* 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 problem sets 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. Take care of yourself! Stay well-rested and drink water.

Important Dates

Add Day:	October 6, 2018	Last day to *add*.
Drop Day:	October 7, 2018	Last day to *drop* the course without a withdraw being recorded.
Withdraw:	November 16, 2018	Last day to *withdraw* from the course.
Lab Check-out:	December 5, 2018	Lab check-out day

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

Exam Dates and Tentative Content

There will be three midterm exams and one cumulative final exam. The date of the final exam is determined by the college and cannot be moved.

October 12, 2018	Exam 1: Chapters 12 and 5
November 2, 2018	Exam 2: Chapter 16
November 30, 2018	Exam 3: Chapters 17 and 18
December 5, 2018	Lab Final (in your lab section)
December 10, 2018	Final Exam: *Cumulative* with emphasis on Chapter 20 material

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.

Lecture	70% of total grade
Practice problems	10%
Midterm exams	45%
Final	15%
Lab	**30% of total grade**
Pre-lab	5%
Lab data and participation	5%
Lab assignments	8%
Lab final	10%
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 (70%)

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. Computers are not necessary during lecture. 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. You may use any resources available to you to solve these problems, and collaboration with classmates is encouraged. I will collect these problems and grade them for completion. Bring loose leaf paper and a writing utensil to class with you.

Exams (45%)

There will be three midterm exams, each worth 15% 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 short answer questions with the opportunity for partial credit. You must show your work in order to receive credit for any answer. I am more interested in how you think about a problem than your final answer. You will be asked to demonstrate your conceptual understanding of the material and apply those concepts in an algebraic context and solve quantitative problems.

Final (15%)

The final exam will be cumulative. The final exam will be administered on **Monday, December 10th 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 (30%)

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 essential safety information. ***If you miss lab lecture, you will not be permitted to complete that lab and you will receive a zero for all related assignments*** (e.g. Pre-lab, lab data, and lab analysis).

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.

Pre-lab (5%)

Pre-labs must be prepared in your laboratory notebook before the start of your laboratory section. Each pre-lab is worth 5 points. I will check your pre-lab at the start of class. If it is not complete, you will forfeit the available points. You must complete your pre-lab prior to starting the experiment of the day.

Lab Data (5%)

Each wet-lab day is worth a total of 10 points: 5 points for data recorded and 5 points for general conduct and lab citizenship. ***Data collected during the lab period must be recorded directly in your laboratory notebook***. You will not receive

credit for any data written on a worksheet or separate piece of paper. Before you leave lab for the day, have me check off on your data in your lab notebook for the available points.

Lab Assignments (8%)
Data analysis worksheets will be posted on the course webpage. The precise nature of the assignment and the number of points available will vary. Due dates will be announced in class and on Canvas.

Lab Final (10%)
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.

Academic Integrity
Students are expected to adhere to the policy on academic integrity that is outlined in the De Anza College manual (https://www.deanza.edu/studenthandbook/academic-integrity.html). I expect all submitted work to represent your own understanding of the material. Cheating, copying, plagiarizing, etc. will not be tolerated, and the minimum consequence will be receiving a zero on that assignment. All laboratory data used in calculations and reported in lab reports must be collected by each student. Multiple instances of academic dishonesty may result in failing the course.

Copying any assignment from another student is cheating. If I see you copying an assignment, both students will receive a zero on that assignment.

Lecture Schedule and Assigned Readings

Chemistry 1B will cover material presented in chapters 5, 12, 16, 17, 18 and 20 of Silberberg. We will also review Chemistry 1A topics presented in chapters 10 and 6 throughout the quarter.

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***
1	9/24	M	Chemistry 1A Essentials *Syllabus* *Silberberg Chapters 1 – 4, 6 – 11* *Labs A1 and A11*
	9/26	W	Introduction to Kinetic Molecular Theory and Properties of Gases *Silberberg Chapter 5*
	9/28	F	Gas Laws: Boyle's Law, Charles' Law, Avogadro's Law and the Ideal Gas Law *Silberberg Chapter 5*
2	10/1	M	Kinetic Properties of Gases *Silberberg Chapter 5*
	10/3	W	Intermolecular Forces and Properties of Water *Silberberg Chapter 12*
	10/5	F	Intermolecular Forces and Properties of Water *Silberberg Chapter 12*
3	10/8	M	Phase Changes and Review of Enthalpy *Silberberg Chapter 12*
	10/10	W	Phase Changes and Review of Enthalpy, continued *Silberberg Chapter 12*
	10/12	F	***Exam 1: Chapters 12 and 5***
4	10/15	M	Chemical Kinetics, Reaction Rates, Reaction Mechanisms and Transition States *Silberberg 16.1-16.2, 16.6, 16.7*
	10/17	W	Chemical Kinetics, Reaction Rates, Reaction Mechanisms and Transition States *Silberberg Chapter 16*
	10/19	F	Chemical Kinetics, Reaction Rates, Reaction Mechanisms and Transition States *Silberberg Chapter 16*
5	10/22	M	The Rate Laws and Integrated Rate Laws *Silberberg Chapter 16*
	10/24	W	The Rate Laws and Integrated Rate Laws *Silberberg Chapter 16*
	10/26	F	Kinetics, Continued *Silberberg Chapter 16*
6	10/29	M	Equilibrium *Silberberg Chapter 17*
	10/31	W	Equilibrium *Silberberg Chapter 17*
	11/2	F	***Exam 2: Chapter 16***
7	11/5	M	Equilibrium: ICE Box Method *Silberberg Chapter 17*
	11/7	W	Equilibrium: ICE Box Method *Silberberg Chapter 17*
	11/9	F	Equilibrium: Le Chatlier's Principle *Silberberg Chapter 17*
8	11/12	M	***Veteran's Day NO CLASS***
	11/14	W	Proton Transfer and Polyprotic Acids *Silberberg Chapter 18*
	11/16	F	Weak Acids and Bases *Silberberg Chapter 18*
9	11/19	M	Acid-base Properties of Salts *Silberberg Chapter 18*

	11/21	W	Acid-base chemistry *Silberberg Chapter 18*
	11/23	F	***Thanksgiving Holiday NO CLASS***
10	11/26	M	Thermodynamics: Reaction Entropy *Silberberg Chapter 20*
	11/28	W	Thermodynamics: Reaction Entropy *Silberberg Chapter 20*
	11/30	F	***Exam 3: Chapters 17 and 18***
11	12/3	M	Thermodynamics: Spontaneous Reactions *Silberberg Chapter 20*
	12/5	W	Thermodynamics *Silberberg Chapter 20*
	12/7	F	Thermodynamics *Silberberg Chapter 20*
12	12/10	M	***Final Exam*** **9:15 am – 11:15 am***

Lab Schedule

The expected laboratory schedule for fall 2018 is given below. Precise pre-lab and post-lab assignments will be posted on Canvas Please note that you *must* check out with me before you leave lab for the day. This will ensure that you get lab points for the day.

Week	Monday	Tuesday	Wednesday	Thursday
1	Check In		B1 Day 1 Molar volume of a gas	
2	B1 Day 2 Molar volume of a gas		B2 Day 1 Vapor pressure of ethanol	
3	B2 Day 2 Vapor pressure of ethanol		B7 Day 1 Synthesis of a green salt	
4	B7 Day 2 Recrystallization and oxalate quantification		B7 Day 3 Iron quantification	
5	B7 Day 4 Hydrate quantification		B3 Day 1 Clock reaction kinetics	
6	B3 Day 2 Clock reaction kinetics		B3 Day 3 Clock reaction kinetics	
7	B3 Day 4 Clock reaction kinetics		B4 Day 1 Determination of an Equilibrium Constant	
8	No class		B4 Day 2 Determination of an Equilibrium Constant	
9	B5 *one day lab* K_a / K_b Determination		B6 Day 1 pK_a of a pH indicator	
10	B6 Day 2 pK_a of a pH indicator		B8 Day 1 Thermodynamics of $Ca(OH)_2$ Solvation	
11	B8 Day 2 Thermodynamics of $Ca(OH)_2$ Solvation		Lab Final Check-Out	

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) 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.

Reckless behavior will not be tolerated. If your actions 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.

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.