

Chemistry 1B-61 Course Outline

Fall 2020

INSTRUCTOR: Dr. Billie Lo

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Laboratory: MW 7:30 PM- 10:20 PM

Lecture: MW 6:00 PM-7:15 PM Zoom Meeting

Credit: 5 units

Prerequisite: Chem 1A with a C or better.

COURSE DESCRIPTION:

Chem 1B is a pre-professional chemistry preparation for students planning a scientific or science related career field. A rigorous study of the fundamentals of chemistry at the first year level combines the study of thermo-dynamics, chemical kinetics, and solution equilibrium. The course includes both lecture and lab work designed to prepare students to enter fields of study as chemistry engineering, medicine, dentistry as well as biological sciences.

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Due to corona virus situation, this class will be an online class for the Fall 2020 quarter, which means you do not have to be on campus to complete any portion of it. You will participate in the course using De Anza college CANVAS. and zoom. Student should have access to a computer, or a smart phone with internet connection, Refer to Student Hub the De Anza Online Resources for Students on the De Anza web site, <http://www.deanza.edu/online-Fall> Student Resource Hub to see how to join the Zoom lecture or the lab sessions. You may also use De Anza Library Chat room for help. If you have any specific needs I should be aware of. please let me know. The PCC Disabled Students Programs and Services is available to assist you during this course.

TEXTBOOKS:

Chemistry, The Molecular Nature of Matter and Change, Martin Silberberg, McGraw Hill.
[Silberberg 9 ed.png](#)

Connect Access Code with ebook attached - [connect-Access Code Price= Summer 20.png](#)

Simple Scientific Calculator (non-programmable), **Safety goggles.**

THE LABORATORY - Virtual Labs

Link are provided on Canvas for the Labster and Chem Collectives virtual labs. Additional labs are conducted as worksheets, details can be found on-line at <https://www.deanza.edu/chemistry/pdf/1A/Experiments> Click on the Experiments and download the details for each experiment.

Academic Dishonesty: Any form of academic dishonesty will be ground for dismissal from the course.

BASIS OF EVALUATION

A. Hourly Exam:

Three hourly exams will be given during the quarter. Make-up exam shall be given for serious and compelling reasons only. Arrangement should be made with your instructor PRIOR TO EXAM TIME by all means. Any late exams if allowed will be subject to 10% deduction in grade.

B. Final Exam:

A comprehensive final exam will be given. Student who misses or fails the final exam will not receive a grade C or better.

C. Homework

The “Connect” **on-line homework assignments** are divided into two different parts for each Chapter – the conceptual and the selected end of the chapter problems. **The advantage of doing them on-line is that you can get instant feed back or online tutoring when you make a mistake or need help. You are encouraged to use the “help” or “hint” on-line to save time.** The program is set to “auto-submit” on the due day. Doing it in a timely manner would help you understand the materials better, so that you can get better grades. Feel free to open the finished assignments for review because the final performance reports sum up your highest score for each chapter only. You should try to do a few problems each day. The due day is usually set right on or only a few days after the lecture on the chapter is done. On completion of 60% of each assigned homework you will get 20 **points** toward your over-all grades. Each chapter assignment is set to open for 2 to 3 weeks and you only need to finish 60% of the each chapter to get full credit. Therefore, usually no extension will be granted to individual student. Feel free to use “hint” or “check. Answer” to get help because you only need to earn 60% of the total assigned point to get 20 points

<https://connect.mheducation.com/class/b-lo-chem-1b-03z-fall-2020>

D. Attendance and withdraws:

Attendance at every meeting is required and will be counted towards your grade.

E. Grading:

Connect Homework	120 Points
Exams	330 Points
Final exam	250 Points
Lab Grade	300 Points
Lab Exams (140)	
Lab Reports(110)	
Lab participation (50)	
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Total	1000 points

880+ pts A

780+ pts B

650+pts C

500+pts D

G. For Chem 1B we cover the following chapters in this order Chapter 5, Chapter 12, Chapter 16, Chapter 17, Chapter 18, Chapter 20.

To do well in the course You should:.

- 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. In fact the "Connect assignments are selected problems from the end of the chapter problems. The 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. Do the Connect homework in a timely manner will help you do well in class.
- 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.

H. Each laboratory experiment must be completed within the specified time. When that period is over, no credit will be given for the lab, but

all labs must be completed to receive a grade in the course. All lab work not conducted will be graded as a zero.

WEEK	DATES	LECTURE	LABORATORY
1	9/21/20 (M)	Ch 5 Gases – Properties of gases Pressure. units, Boyle’s law (V & P), Charles’s law (V & T), Avogadro’s law (V & n); combined ideal gas law	INTRO/Connect HOL1 – Getting started
	9/23/20 (W)	Ch 5 Kinetic molecular theory molecular energy distribution, an ideal gas; diffusion and effusion; van der Waal’s equation; vapor pressure; vapor pressure and boiling point; partial pressure & Dalton’s law	Review- VSEPR/molecular shape/polarity
2	9/28/20 (M)	Review, worksheet #1 molecular polarity - Electronegativity; periodic trends of electronegativity; bond polarity; 12.1 Intermolecular forces (IMF), relative strength of IMFs: ions versus permanent dipoles versus temporary dipoles; hydrogen bond, Water	Review- VSEPR/molecular shape/polarity/orbital hybrid
	9/30/20 (W)	Ch 12 Phase diagrams, phase changes: melting, freezing, evaporation, condensation, sublimation, deposition; heat of fusion, heat of vaporization; heating-cooling curves; phase change equilibrium; triple point; critical point; supercritical fluids	HOL2-Lab Safety
3	10/5/20 (M)	Ch 12 Surface tension; capillarity; viscosity; crystalline versus amorphous solids; crystal lattices; unit cells: simple cubic, body-centered cubic, face-centered cubic; cubic versus hexagonal closet packing; conductors, semiconductors, and insulators; liquid crystals	MOLAR VOLUME (1)
	10/7/20 (W)	Exam 1 •	MOLAR VOLUME (2)
4	10/12/20 (M)	Ch16 Kinetics – A molecule in motion stays in motion.	VAPOR PRESSURE (1)
	10/14/20 (W)	Ch16 Rate laws 12.5 Collision theory	VAPOR PRESSURE (2)_
5	10/19/20 (M)	Ch 16 Reaction mechanisms – Taking a reaction step-by-step.	
	10/21/20 (W)	Ch17 Equilibrium, Equilibrium constants 13.2 Reaction quotients ; similarity and differences between K and Q; Kc versus Kp , Predicting direction of reaction by comparing Q and K	HOL3- Boyle’s Law
6	10/26/20 (M)	Ch 17.4 Solving equilibrium problems	HOL4 Kinetics /KINETICS (1)/
	10/28/20 (M)	Ch 17 Le Châtelier’s Principle	HOL4 Kinetics/KINETICS (2)
7	11/2/20 (M)	Exam 2•	HOL5-Beer's Law /BEER’S LAW
	11/4/20 (W)	Ch 18 Acids and bases Definitions of acids and bases: Arrhenius, Brønsted-Lowry, Lewis; acid dissociation constants (Ka); strong acids and strong bases •	LAB MIDTERM
8	11/9/20 (M)	Ch 18 The pH scale Auto-ionization of water; definition of neutral versus neutralized; pH scale; temperature dependence of neutral pH; pOH; Kw	Kc BY SPECTRO 20 (1)
	11/11/20 (W)	VETERAN’S DAY – HOLIDAY – NO CLASS	
9	11/16/20(M)	Ch 18 The pH scale Auto-ionization of water; definition of neutral versus neutralized; pH scale; temperature dependence of neutral pH; pOH; Kw	HOL6-Equilibrium and Le Châtelier’s Principle (1)
	11/18/20(W)	Ch18 Strong versus weak acids, Conjugate acid-base pairs; relative acid strength and direction of neutralization; determining Ka from; relationship between Ka and Kb;	HOL6-Equilibrium and Le Châtelier’s Principle(2)
10	11/23/20 (M)	Ch 18 Salts- Salts that yield acidic, basic, and neutral solutions; solutions of weakly acidic cations and weakly basic anions; salts of amphoteric ions Ch 18 Acid-base reactions Polyprotic acids	HOL7- Determination of Ka of a weak acid/Acid-Base Titration Curves (1)
	11/25/20 (W)	Ch 20 Spontaneity16.4 Free energy - entropy; microstates; first, second, and third laws of thermodynamics; standard molar enthalpies; entropy changes in common chemical and physical processes	HOL7- Determination of Ka of a weak acid/Acid-Base Titration Curves (2)
	11/26 – 11/29	THANKSGIVING HOLIDAY – NO CLASS	
11	11/30/20 (M)	Exam 3	
	12/2/20 (W)	Ch 20 Relationship between free energy and equilibrium; free energy outside of the standard state; reaction progress diagrams Review	LAB FINAL

12	12/7/20 (M)	FINAL	

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.