

Chemistry 1B-61 Course Outline

Summer 2020

INSTRUCTOR: Dr. Billie Lo

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Laboratory: MTWTh 11:30 AM- 2:20 PM SC2204

Lecture: MW 2:30 PM-3:45 PM S32

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 Spring 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-Spring> 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, 8th edition, 2017.

The ebook is available at \$30 per quarter [eBook_CreditCard_2015.pdf](#) 

The isbn for the Chem 1B Silberberg Ebk: 9781307600964-\$30

Chemistry – The Molecular Nature of Matter and Change, Martin Silberberg, McGraw-Hill Higher Education 7th Edition.

Lab: General Chemistry Laboratory Manual 1A-1B-1C. Wiley Custom Services, 2014 Edition.

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

THE LABORATORY

Lab safety rules are strictly enforced. **SAFETY GLASSES or GOGGLES** must be worn **AT ALL TIMES** while you are in the laboratory. Each student is required to have a **lab notebook** to outline the

lab procedures, record experiment data, and calculations. It will be evaluated as part of the grade. You are expected to arrive in the laboratory on time. Preview the lab materials before coming to lab is required. Students must check out with me at the end of each lab to have their notebook stamped and sign a roll sheet. Each laboratory experiment must be completed within the specified time. When that period is over, no credit can 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.

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. Quizzes (Approx. 10-15 minutes):

Quizzes will be given at least once a week to those students who are present when the quizzes are passed out. Each quiz counts 10 points or more.

B. 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.

C. 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.

D. Homework

A. 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-02>

Attendance and withdraws:

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

F. 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)	

Total	1000 points
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880+ pts A

780+ pts B

650+pts C

500+pts D

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 assignment is the same as the end of the chapter 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. 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.
1. 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	6/29/20 (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	IINTRO LABSTER- LAB SAFETY
	6/30/20 (T)	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	VSEPR/molecular shape/polarity
	7/1/20 (W)	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	GAS LAW(1)
	7/2/20 (Th)	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	GAS LAW(2)
2	7/6/20 (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 12)
	7/7/20 (T)	Exam 1 •	MOLAR VOLUME (2)
	7/8/20 (W)	Ch16 Kinetics – A molecule in motion stays in motion.	VAPOR PRESSURE (1)
	7/9/20 (Th)	Ch16 Rate laws 12.5 Collision theory	VAPOR PRESSURE (2)_
3	7/13/20 (M)	Ch 16 Reaction mechanisms – Taking a reaction step-by-step.	BEER'S LAW
	7/14/20 (T)	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	KINETICS (1)
	7/15/20 (W)	Ch 17.4 Solving equilibrium problems	KINETICS (2)
	7/16/20 (Th)	Ch 17 Le Châtelier's Principle	KINETICS (3)
4	7/20/20 (M)	Exam 2•	Kc BY SPECTRO 20 (1)
	7/21/20 (T)	Ch 18 Acids and bases Definitions of acids and bases: Arrhenius, Brønsted-Lowry, Lewis; acid dissociation constants (K_a); strong acids and strong bases •	LAB MIDTERM
	7/22/20 (W)	Ch 18 The pH scale Auto-ionization of water; definition of neutral versus neutralized; pH scale; temperature dependence of neutral pH; pOH; K_w	Kc BY SPECTRO 20 (2)
	7/23/20 (Th)	Ch 18 The pH scale Auto-ionization of water; definition of neutral versus neutralized; pH scale; temperature dependence of neutral pH; pOH; K_w	GREEN SALT(1)
5	7/27/20 (M)	Ch18 Strong versus weak acids , Conjugate acid-base pairs; relative acid strength and direction of neutralization; determining K_a from; relationship between K_a and K_b ;	GREEN SALT(2)
	7/28/20 (T)	Ch 18 Salts - Salts that yield acidic, basic, and neutral solutions; solutions of weakly acidic cations and weakly basic anions; salts of amphoteric ions	Ka OF A WEAK ACID (1)
	7/29/20 (W)	Ch 18 Acid-base reactions Polyprotic acids	Ka OF A WEAK ACID (2)
	7/30/20 (Th)	Ch 20 Spontaneity 16.4 Free energy - entropy; microstates; first, second, and third laws of thermodynamics; standard molar enthalpies; entropy changes in common chemical and physical processes	Pka OF INDICATOR (1)
6	8/3/20 (M)	Exam 3	Pka OF INDICATOR (2)
	8/4/20 (T)	Ch 20 Reaction progress diagrams Determining entropy microscopically and macroscopically; calculating entropy; spontaneity of endothermic and exothermic processes	LAB FINAL

		Ch 20 Entropy – The disorder in my office is constantly increasing.	
	8/5/20 (W)	Ch 20 Relationship between free energy and equilibrium; free energy outside of the standard state; reaction progress diagrams Review	
	8/6/20 (Th)	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.