

Chemistry 1B-30Z/31Z Course Outline

Spring 2021

INSTRUCTOR: Dr. Billie Lo

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Laboratory(31Z): TTh Synch 7:30 PM- 8:20 PM

Asynch: 8:30 PM – 10:20 PM

(30Z): TBA

Lecture(30Z/31Z): TTh 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 Refer to Canvas for information; you purchase the code separately if you already have the book.

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

THE LABORATORY – HOL and Virtual Labs

- (1) HOL lab kits are provided by De Anza College with no charge to the students. You **should order the HOL kit directly from the De Anza bookstore** after the Censors Day when the student enrollment is finalized (around the third week). If you are not in the U.S. this quarter, you should let the bookstore know so they can ship the kit by air and include the invoice inside for custom clearance purpose.
- (2) Virtue Labs: Link are provided on Canvas for the 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 three parts for each Chapter – the conceptual and the selected end of the chapter problems (divided into ChX-1 and ChX-2). The **advantage of doing them on-line is that you can get instant feedback, or online tutoring when you make a mistake or when you need help.** Doing it in a timely manner (a few questions every day) would help you understand the materials better, thus get better grades. Feel free to open the finished assignments for review at any time because the final performance reports sum up your highest scores for each chapter only. The due day is usually set right on or shortly 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. **The reason for such low setting of only 60% is to encourage you to use the “help” or “hint” on-line to save time while still learning from the assignments.** The program is set to allow late submission; but with **10% deduction** in points per day. You may use the link on Canvas to reach the Connect website or the link below:

<https://connect.mheducation.com/class/b-lo-chem-1b-31z-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

*****The grading in this course will follow what is written in this syllabus and according to the scale listed above.** From time to time I will show a spreadsheet summarizing your grades. It is **your responsibility** to let me know the discrepancies so I can make corrections as soon as possible. **Please note that all the single relevant grades recorded in Canvas are correct and will be exported to this spreadsheet. As a precaution though, don't trust your grade total, %, or the A, B,C etc. listed in Canvas.**

The best way to figure out how you are doing in the class is to calculate how many points you have lost by subtracting your scores from the maximum possible points for each exam or assignment and deduct it from 1000 points. The worksheets are extra points which may be used to make up for the points you've lost. Then, by the point standard above you can figure out how many points you can afford to lose and still get your desired grade. For example, if you have lost total 90 points, to get an "A", you can only lose 30 more points; but if you have a perfect score on 3 worksheets (10 points each), then you may lose a total of 60 points still get an "A".

G. **"Getting acquainted" Zoom meeting:** You are required to attend a short "Getting Acquainted" zoom meeting so that I get to know you - your goal, your expectation or any hardships.

For section 31, it will be 4/8/21 and 4/11/21 8:30-9:30PM

For section 30, it will be 4/13/21 and 4/15/21 3:00-3:30pm, 5:20 – 5:50pm.

It's divided into 10 minute slots, maximum 3 students per slots. Just go to Canvas course, click "Find Appointment", you will see all the available appointments. Sign up for any of the 10 minutes slots. Attend the meeting with your camera on. Meeting ID: 2038756594 (the same as my office hour meeting ID).

H. 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.
- I. 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	4/6/21 (T)	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 HOL Registration/ Introduction
	4/8/21 (Th)	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 Complete Academic Integrity Contract
2	4/13/21 (T)	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 (Report 1)
	4/15/21 (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	HOL1 – Getting started (Report 2)
3	4/20/21 (T)	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))(Report 4)
	4/22/21 (Th)	Exam 1 •	MOLAR VOLUME (2) HOL2-Lab Safety (Report 3)
4	4/27/21 (T)	Ch16 Kinetics – A molecule in motion stays in motion.	HOL3- Boyle’s Law (1)
	4/29/21 (Th)	Ch16 Rate laws 12.5 Collision theory	HOL3- Boyle’s Law(2)(Report 5)
5	5/4/21 (T)	Ch 16 Reaction mechanisms – Taking a reaction step-by-step.	HOL4-Kinetics (1)
	5/6/21 (Th)	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	HOL4-Kinetics (2) (Report 6)
6	5/11/21 (T)	Ch 17.4 Solving equilibrium problems	LAB MIDTERM
	5/13/21 (Th)	Ch 17 Le Châtelier’s Principle	HOL5-Beer's Law (1)
7	5/18/21 (T)	Exam 2•	HOL5-Beer's Law (2) (Report 7)
	5/20/21 (Th)	Ch 18 Acids and bases Definitions of acids and bases: Arrhenius, Brønsted-Lowry, Lewis; acid dissociation constants (K_a); strong acids and strong bases •	Kc BY SPECTRO 20 (1)
8	5/25/21 (T)	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 (2) (Report 8)
	5/27/21(Th)	Ch 18 The pH scale Auto-ionization of water; definition of neutral versus neutralized; pH scale; temperature dependence; pOH; Kw	HOL6-Equilibrium and Le Châtelier’s Principle(1)
	5/28/21	Last day to drop classes with a "W"	
	5/29-5/31/21	Memorial Day Weekend - offices closed; no classe	
9	6/1/21 (T)	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 ;	HOL6-Equilibrium and Le Châtelier’s Principle(2)(Report (9)
	6/3/21 (Th)	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	K_a of a Weak Acid (Report 10)
10	6/8/21 (T)	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	Calcium Hydroxide(1)
	6/10/21 (1)(Th)	Exam 3	Calcium Hydroxide(2))(Report (11)
11	6/15/21 (T)	Ch 20 Relationship between free energy and equilibrium; free energy outside of the standard state; reaction progress diagrams Review	LAB FINAL
	6//17/21 (Th)	Ch 20 Relationship between free energy and equilibrium; free energy outside of the standard state; reaction progress diagrams Review	
12	6/22/21 (T)	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.