

Chemistry 1A - 61 - Course Outline

Winter, 2018

INSTRUCTOR: Dr. Billie Lo billielo@comcast.net

Lecture: MW 6:00 – 7:15PM SC3101

Laboratory: Section 61 MW 2:30 – 5:20 PM SC2202
Section 62 MW 7:30 – 10:20 PM SC2202

Credit: 5 units

PREREQUISITE:

Chem. 25 with a C or better or high school chemistry with a B or better, Math C or higher.

ACCEPTABLE FOR CREDIT:

University of California, California State University and Colleges.

COURSE DESCRIPTION:

Chem. 1A 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 atomic and molecular structure, quantum theory, thermo chemistry, gases, solutions, and qualitative analysis with the classical study of properties of atoms and molecules and their reactivity. The course includes both lecture and lab work designed to prepare students to enter as chemistry, engineering, medicine, dentistry as well as biological sciences fields of study.

TEXTS:

Chemistry, The Molecular Nature of Matter and Change, Martin Silberberg, McGraw Hill, 8th edition, 2017.

Lab Manual

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.

*****A Simple Scientific Calculator (non-programmable) and Safety goggles are required.**

Programmable calculators are not allowed for the exams or quizzes; students must use a simple scientific calculator instead.

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 the beginning or end of class meetings to those students who are present at the time of quizzes. Each quiz counts about 20 points. Pre-lecture reading materials may be covered in the quiz at end of the lecture after they have been explained in class that day. No make-up quiz is given.

B. Hourly Exam:

Three hourly exams will be given during the semester. Make-up exam shall be given for serious

and compelling reasons only. Consult your instructor PRIOR TO **EXAM TIME** by all means. There will be 10% deduction in grades for all the make-up exams.

C. Final Exam:

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

D. 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 when you make a mistake. You are encouraged to use the “help” or “hint” on-line to save time.** A third session (the chapter Review) is set for practice only, there is no point given. The program is set to “auto-submit” on the due day. Doing it in a timely manner would help you to understand the materials better, so that you can get better grades. Feel free to open the finished assignments for review because the final performance report 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 70% of the total assigned homework you will get 50 extra credit **points** toward your over-all grades. Each chapter assignment is set to open for 3 to 4 weeks and you only need to finish 70% of the total to get full credit. So, usually no extension will be granted to individual student.

E. The bookstore sells the textbook, with or without the Connect Access Code. With the /Connect access Code, it costs \$142.90, and without the Connect code costs \$107.20. You may also purchase the access Code on-line if you already have a textbook. To access “CONNECT”

Chem 1A-61 go to: <http://connect.mheducation.com/class/b-lo-chem-1a-61-w2018>

Chem 1C-62 go to: <http://connect.mheducation.com/class/b-lo-chem-1a-62-w-2018>

F. Attendance:

Attendance will be enforced. **Any student who has two or more lab or lecture absences may be dropped from the course.**

G. Chemical Disposal:

As a concern for the environment, proper chemical disposal is essential. Students who do not comply with directed procedures may be dropped from the course for repeated offenses.

I. Worksheet schedule: Extra points – 10 points for each worksheet.

Five worksheet assignments will be given, 10 points each . Worksheets will be graded according to accuracy and neatness. Points will be deducted if late (-10% for each additional day.)

Worksheet #	Content	Chapter	Date open	Date Due
1	Nomenclature	2	1/17/18	1/25/18
2	Net Ion equations	4	1/31/18	2/7/18
3	Acid Base Reactions	4	2/5/18	2/12/18
4	Balance Equations	4, Expt. 9	2/26/18	3/5/18
5	Geometry (shape)	9,10	3/14/18	3/21/18

H. Grading:

Exams	330
Quizzes	120+
Final exam	250

Lab Midterm and Lab Final	140
Lab Reports	90
Lab Notebook	50
Lab Performance	20

Total	1000						
880+ pts	A	780+ pts	B	650+pts	C	500+pts	D

Extra Credit:

1. "Connect" on-line homework 50 Points when complete 70% of the assigned.
2. Worksheet: 10 points each.

	CHEM 1A	LECTURE	& EXAM SCHEDULE	LABORATORY SCHEDULE
WK	DATE	CHAPTER	CONTENT	
1	M 1/8/18	Chapter 1	Measurement, Units, Uncertainty, Precision and Accuracy, Scientific Notation	Lab Check-In
	W 1/10/18	Chapter 1 Chapter 2	Mathematical Treatment of Measurement Results, Atomic Theory, Atomic Structure	<i>Measurement</i>
2	M 1/15/18	-----	MARTIN LUTHER KING'S DAY -----	-----
	W 1/17/18	Chapter 2	Chemical Formulas, the Periodic Table, Atomic Structure, Symbols, Nomenclature of Molecular and Ionic Compounds,	<i>Nomenclature</i>
3	M 1/22/18	Chapter 3	Stoichiometry of Formula and Equations	<i>Expt 4 Hydrate(1)</i>
	W 1/24/18	Chapter 3	Formula Mass and the Mole Concept, Empirical Formula and Molecular Formula, Molarity and Other Units for Concentration	<i>Expt 4 Hydrate(2) Empirical Formula of Hydrate (2)</i>
4	M 1/29/18		<i>Exam 1</i>	<i>Precipitation(1)</i>
	W 1/31/18	Chapter 4	Writing and Balancing Chemical Equations, Classifying Chemical Reactions	<i>Precipitation(2)</i>
5	M 2/5/18	Chapter 4 Chapter 6	Reaction Stoichiometry, Yields, Quantitative Analysis Thermochemistry: Energy Basics,	<i>Type of reactions(1)</i>
	W 2/7/18	Chapter 6	Thermochemistry: Hess's Law, Calorimetry, Enthalpy	<i>Conductivity (1)</i>
6	M 2/12/18	Chapter 6	Thermochemistry: Calorimetry, Enthalpy	<i>Conductivity (2)</i>
	W 2/14/18		<i>Exam 2</i>	Lab Midterm <i>Expt 5 Acid-Base Titration (1)</i>
7	M 2/19/18	-----	PRESIDENT'S DAY -----	-----
	W 2/21/18	Chapter 7	Radiation- Energy, Electromagnetic Waves, λ & ν , the Bohr Model	<i>Expt 5 Acid-Base Titration (2)</i>
8	M 2/26/18	Chapter 7	Quantum Theory, Quantum # & sublevel-orbitals,	<i>Expt 9 Redox Titration (1)</i>
	W 2/28/18	Chapter 7 Chapter 8	Quantum Theory, Quantum # & sublevel-orbitals, Electron Configuration & Chem. Periodicity (Trends in Ionization Energies, Electronegativities)	<i>Expt 9 Redox Titration (2)</i>
9	M 3/5/18	Chapter 8	Electron Configuration & Chem. Periodicity (Trends in Ionization Energies, Electronegativities)	<i>Expt 9 Redox Titration (3)</i>
	W 3/7/18		<i>Exam 3</i>	<i>Expt 6 Calorimetric Measurements (1)</i>
10	M 3/12/18	Chapter 9 Chapter 10	Models of Chemical Bonding Molecular Structure, VSEPR Theory, Shape and Polarity,	<i>Expt 6 Calorimetric Measurements (2)</i>
	W 3/14/18	Chapter 10	Molecular Structure, VSEPR Theory, Shape and Polarity,	<i>Expt 10 Spectroscopy Line Spectra of H-atom</i>
11	M 3/19/18	Chapter 11	Valence Bonds Theory, Hybrid Atomic Orbitals, Multiple Bonds Molecular Orbital Theory	<i>Expt 11 Molecular Model (1)</i>
	W 3/21/18	Review		<i>Lab final Check - Out</i>
12	M 3/26/18		Final Exam	

J. CHEMISTRY 1A LABORATORY

1. **SAFETY GLASSES OR GOGGLES** must be worn **AT ALL TIMES** while you are in the laboratory.
2. 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 lab grade.
3. You are expected to arrive in the laboratory on time. Tardiness of 15 minutes or more will not be permitted. Preview the lab materials before coming to lab is required
4. Students must clean and return all items borrowed to the stock room **no later than 5:05 PM** each day of the experiment.
5. Student must check out with the instructor at the end of each lab to have their notebook stamped and sign a roll sheet.
6. 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 zero.
7. **Chemical Disposal:**
Proper chemical disposal is essential. Students who do not comply with directed procedures may be dropped from the course for repeated offenses.
8. Please note that you are required to **officially** check out of your lab locker whether you remain in the course or drop the course. Failure to check out of lab on time will result in a late fee and may also result in your grades being held and a block placed on your future registration.
9. **If you drop within the first two weeks of class and fail to check out of lab, your locker may be reassigned to another student by the instructor, and you will be held responsible for any missing or broken lab locker equipment. After the first two weeks of class you must checkout by the assigned checkout date for your laboratory section.**

K. FORMAT OF THE LABNOTEBOOK (a permanently bound notebook): *Everything should be written in ink in the notebook.*

1. Number and Title of the experiment
2. Purpose/theory of the experiment (brief)
3. Formula for the calculation.
4. Procedure in detail for the experiment. A photocopy of the lab manual is not allowed. Check with the lab instructor which section will be performed next to minimize preparation time and effort.

The above should be fully prepared prior to attending the lab lecture and it should be stamped before lab lecture.

5. Data (laboratory work) must be entered **immediately** and **directly** into the lab notebook **in ink.**
6. Calculations: The laboratory midterm and final are "**open-notebook**". A well-prepared notebook would be helpful during these exams.

L. FORMAT OF THE LAB REPORT – One lab report per each experiment. No point will be given Unless the student actually performed the experiment.

1. Number and Title of the experiment.
2. Theory (more detail) and formula for the calculation
3. Procedure for the experiment (brief).
4. Data and calculation. Show at least one set-up for each different type of calculations.
5. Results (including all graphs) and discussion in doubt.
6. Pre-lab and post-lab questions must be answered and attached to the lab report.

Report is due on day 2 of the next experiment. Penalty for late reports: 1-2 day late less 10%, 2-7 day late less 40% More than 1 week late, less 60%.

Laboratory Safety Rules *Please sign this form and return it to your instructor*

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.

By signing below, I, _____,
First Name Family Name

acknowledge that I fully understand and agree to abide by the laboratory safety rules listed above. Further, I acknowledge that my failure to abide by these rules will result in my being dropped from this chemistry class immediately.

Signature

Date

Student Learning Outcome(s):

*Identify and explain trends in the periodic table.

*Construct balanced reaction equations and illustrate principles of stoichiometry.

*Apply the first law of thermodynamics to chemical reactions.