

Chemistry 1A - 63 and 64 - Course Outline

Winter, 2017

INSTRUCTOR: Dr. Billie Lo billielo@comcast.net

Lecture: TTh 6:00 – 7:15PM S75

Laboratory: Section 64 TTh 7:30 – 10:20 PM SC2202

Credit: 5 units

PREREQUISITE:

Chem. 050 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

The Chem 1A SLOs

1. Identify and explain trends in the periodic table.
2. Construct balanced reaction equations and illustrate principles of stoichiometry.
3. Apply the first law of thermodynamics to chemical reactions.

TEXTS:

Lecture: We will use the free online textbook from OpenStax. <https://openstax.org/details/chemistry>

Students can also purchase an individual printed copy of the text through Amazon for \$55. If you wish to order a printed copy you should order it ASAP so it will arrive on time before classes start on the 9th.

OTHER REFERENCE BOOK: Chemistry, The Molecular Nature of Matter and Change, Martin Silberberg, McGraw Hill, 7th edition, 2015.

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. 5 - 10 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 15 points. Pre-lectured reading materials may be covered at end of the lecture. 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. Attendance:

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

E. 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.

F. <u>Grading:</u>	Lecture	68%	Quizzes	100+
			Exams	330
			Final exam	250
	Lab	32%	Lab Tests	140
			Lab Reports	90
			Lab Performance	40
			Lab Notebook	50

Total 1000

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

G. Worksheet schedule: Extra points

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	1/17/17	1/24/17
2	Chemical Reactions	4	2/2/17	2/9/17
3	Net Ion equations	4	2/2/17	2/14/17
4	Balance Equations	4, Expt. 9	2/14/17	2/23/17
5	Geometry (shape)	7, 8	3/16/17	3/21/17

CHEMISTRY 1A TENTATIVE LECTURE AND EXAM SCHEDULE
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	CHEM 1A	LECTURE &	EXAM SCHEDULE	LABORATORY SCHEDULE
WK	DATE	CHAPTER	CONTENT	
1	T 1/10/17	Chapter 1	Measurement, Units, Uncertainty, Precision and Accuracy, Scientific Notation	Lab Check-In
	Th 1/12/17	Chapter 1	Mathematical Treatment of Measurement Results,	<i>Measurement</i>
2	T 1/17/17	Chapter 2	Atomic Theory, Atomic Structure (Subatomic Particles) and Symbols Chemical Nomenclature	<i>Nomenclature</i>
	Th 1/19/17	Chapter 2	Chemical Formulas, the Periodic Table, Molecular and Ionic Compounds, Chemical Nomenclature	<i>Expt 4 Hydrate(1)</i> <i>Empirical Formula of Hydrate (1)</i>
3	T 1/24/17	Chapter 3	Composition of Substances and Solutions, Formula and Mole concept	<i>Expt 4 Hydrate(2)</i> <i>Empirical Formula of Hydrate (2)</i>
	Th 1/26/17	Chapter 3	Formula Mass and the Mole Concept, Empirical Formula and Molecular Formula, Molarity and Other Units for Solution Concentrations	Precipitation(1)
4	T 1/31/17		<i>Exam 1</i>	Precipitation(2)
	Th 2/2/17	Chapter 4	Writing and Balancing Chemical Equat'ns, Classifying Chemical Reactions	Precipitation(3)
5	T 2/7/17	Chapter 4	Reaction Stoichiometry, Yields, Quantitative Analysis	<i>Type of reactions(1)</i>
	Th 2/9/17	Chapter 5	Thermochemistry: Energy Basics, Exo- & Endo-thermic Reaction, Hess's Law	<i>Type of reactions(2)</i>
6	T 2/14/17	Chapter 5	Thermochemistry: Calorimetry, Enthalpy	<i>Conductivity (1)</i>
	Th 2/16/17		<i>Exam 2</i>	<i>Conductivity (2)</i>
7	T 2/21/17	Chapter 6	Radiation- Energy, Electromagnetic Waves, λ & ν , the Bohr Model	<i>Review</i>
	Th 2/23/17	Chapter 6	the Bohr Model, Quantum Theory, Quantum # & sublevel-orbitals,	<i>Expt 5 Acid-Base Titration (1)</i> Lab Midterm
8	T 2/28/17	Chapter 6	Electron Configuration of Atoms Periodic variation variation of Atoms (chemical periodicity – Trends in Ionization Energies, Electronegativities.....	<i>Expt 5</i> <i>Acid-Base Titration (2)</i>
	Th 3/2/17	Chapter 7	Chemical Bonding and Molecular Geometry: Ionic and Covalent Bonding, Lewis Symbols and Structures, Formal Charges and Resonance Strengths of ionic and covalent Bonds, Bond length, bond strength bond energy & ΔH_{rxn} , Molecular Structure and Polarity	<i>Expt 6</i> <i>Calorimetric Measurements (1)</i>
9	T 3/7/16	Chapter 7	Molecular Structure, VSEPR Theory, Shape and Polarity,	<i>Expt 6</i> <i>Calorimetric Measurements (2)</i>
	Th 3/9/17		<i>Exam 3</i>	<i>Expt 9 Redox Titration (1)</i>
10	T 3/14/17	Chapter 7	Molecular Structure, VSEPR Theory, Shape and Polarity,	<i>Expt 9</i> <i>Redox Titration (2)</i>
	Th 3/16/17	Chapter 8	Valence Bonds Theory, Hybrid Atomic Orbitals, Multiple Bonds	<i>Expt 10 Spectroscopy Line Spectra of H-atom</i> <i>Expt 11 Molecular Model (1)</i>
11	T 3/21/17	Chapter 8	Molecular Orbital Theory	<i>Expt 11 Molecular Model (2)</i>
	Th 3/23/17	Review		<i>Lab final</i> <i>Check - Out</i>
12	T 3/28/16		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 7:05 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