

CHEMISTRY 1A (General Chemistry)

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**Note: The information on this syllabus may be subject to revision, if any information is revised students will be notified in advance.

Course Information

Chemistry 1A is a 5 unit class and is the first semester of the General Chemistry series. This course details fundamental theory and principles of atomic and molecular structure, physical states and chemical reactions. Included is the study of elements, compounds, periodic relationships, bonding, acids and bases, oxidation-reduction, energy, solutions, electrolytes and chemical equations. Descriptive chemistry of water and selected nonmetals including hydrogen, oxygen and carbon is presented.

Course Objectives

The following is a list of course objectives as stated in the course outline of record for El Camino College.

1. The student will become more proficient in the ability to use scientific terminology; name and write chemical formulas for inorganic compounds: binary nonmetal compounds, salts, acids and bases; write and classify chemical equations for elementary chemical reactions and perform stoichiometric calculations involving chemical reactions.
2. The student will be able to provide a historical picture of the development of atomic theory; state the fundamentals of quantum theory; assign quantum numbers and construct orbital diagrams; predict and explain periodic trends of elements in terms of electronic configurations; describe and illustrate the structure and bonding of molecules by constructing Lewis structures, sketching and labeling the molecular geometries of a molecule, describing the hybridization of the atoms involved, and determining polarity; predict and explain properties of molecules in terms of structure and bonding and predict and explain properties of conductors, semiconductors and insulators in terms of structure and bonding.
3. Use the Kinetic Molecular Theory to explain the behavior of gases; compare and contrast various gas laws; perform gas law calculations; relate intermolecular forces to observed properties of solids, liquids and gases; interpret phase diagrams and describe basic crystal systems.
4. Explain solubility in terms of properties of both solute and solvent; determine concentrations of solutions quantitatively and experimentally; give qualitative and quantitative descriptions of solution properties as a function of solute type and solute concentration; classify solutes as strong, weak, or non-electrolytes and write net ionic equations for chemical reactions.
5. Compare and contrast acid-base theories; predict acid strengths based on structure and write and classify acid-base reactions.

- Determine oxidation numbers; balance oxidation-reduction equations; identify oxidizing and reducing agents.
- Apply the First Law of Thermodynamics; relate ΔE to ΔH ; calculate ΔH through calorimetry, Hess' Law, enthalpy of formation, and bond energies.
- Compare and contrast properties and reactions within a family of compounds; describe the role of nonmetals and nonmetal compounds in pollution; draw Lewis structure and name simple organic compounds; identify the classes of organic compounds.
- Learn fundamental chemistry techniques such as gravimetric analysis, spectral analysis, titration, use of pH meter; become proficient in the use of the following laboratory equipment: analytical balance, spectrophotometer, pH meter, burets, pipets, volumetric flasks; illustrate basic principles of gases, solutions, acids and bases, and oxidizing and reducing agents through experimental set ups.

Prerequisites

Chemistry 4 with the grade of C or better; or one year high school chemistry or equivalent and qualification by testing (El Camino College Chemistry Placement Test). You must also be eligible for Math 170.

Required Text and Supplementary Materials

- General Chemistry Principles and Modern Applications 9th ed.*, by Petrucci, Harwood, Herring and Madura.
- Chemistry IA Laboratory Experiments*, by Scroggins.
- Scientific Calculator (capable of doing exponential notation calculations)
- Safety Goggles (Instructor Approved)
- USB flash drive, 128 MB or higher

Grading Policy

Approximate distribution of points:

Exams (5 @ 100)	500
Homework	75
Labs	180
Comprehensive Final	145
Course Total	900

Final letter grades

Course letter grades will be assigned according to the following percentage of total point earned:

100 – 89 % = A; 88 – 79 % = B; 78 – 67% C; 66– 55 % = D; <55% = F

Special Grading Notes

-Because chemistry is a laboratory science, passing work (56% or more of possible points) in the laboratory portion of the course is required in order to earn an overall grade of “C” or higher, regardless of test and quiz scores.

-A minimum of 66 % in the Lecture portion of the course (exams, homework, final exam) is required in order to earn an overall grade of “C” or higher, regardless of lab scores.

-The Final exam is cumulative/comprehensive for the course.

Exams

There 5 exams and a cumulative final exam. Missed exams will result in a zero grade except in cases of emergency. To discuss an emergency situation, you must contact me two days prior to the scheduled exam. In all cases the student must provide paperwork to verify the excused absence. If you show up late for class and miss the exam you will receive a zero.

Laboratory

Chemistry is a laboratory science therefore in order to pass this course; you must pass the laboratory independent of lecture. Absences will result in a zero grade, and there are no make-up labs. You must do your lab work in your scheduled period. In preparation for the lab, you should study the pertinent sections in you lab manual, and review lecture notes pertaining to the experiment. You must be prepared for the experiment before you come to lab if you wish to complete the experiment in the time allotted. Students who arrive late will receive a penalty and may be asked to leave. During the lab period, to receive credit you must complete the data tables and record any other observations about the experiment in ink and have it initialed by the instructor before you leave. Unless otherwise announced lab reports are due at the beginning of the 2nd class after the lab. Pages must be stapled in numerical sequence. Late Lab reports will be penalized 2 points per class day late. Being tardy or absent is not an excuse for late lab reports. Lab reports are like exams and any copying or false reporting of data is considered cheating and will be reported to the dean.

Homework Assignments

Working problems is an essential part of the learning process and gives you practice, drill and reinforcement of the course material in preparation for the exams. Online Mastering Chemistry homework assignments will be assigned on a regular basis (for each chapter) and must be submitted online before the submission deadline which will be announced in class.

Academic Courtesy

Students should be on time and prepared for class. Talking during lecture is disruptive. Questions related to classroom topics are greatly encouraged. Please refrain from side conversations even if these discussions pertain to the class as it can be disruptive for other students. It is better to ask the instructor for clarification than to disrupt the class with talking. Turn off cell phones, pagers, iPods, MP3 players and other personal electronic devices as these are disruptive to everybody.

Cheating, Plagiarism, Dishonesty

All cases of cheating, plagiarism, or dishonesty will be reported to the Dean of Students. All work that you submit must be **your own work**.

Study Tips

-Spend at least 13 –17 hours per week studying in a distraction free environment. Study on many different days a week rather than cramming before an exam.

-Read chapter once prior to the lecture on the material. This will allow you to better understand the lecture material and save you study time later.

-Take detailed in-class notes. Soon after class, review your lecture notes and fix any areas that need clarification. Rewrite your notes in a way that makes sense to you.

-Do the assigned homework problems. Review the chapter material, lecture notes and handout material as needed to solve these problems. You should write out solutions in a complete and accurate way so that you will be able to solve problems under exam conditions.

-Keep a separate notebook or section just for problems. At a later time, repeat problems you did incorrectly. Do this until you feel comfortable with them and can do them quickly.

-When material must be memorized use flash cards. Put an item to be memorized on one side of the card and the response on the other side.

-Once you are familiar with material (not before), study partners or groups are recommended as effective ways to increase your understanding and to review for exams.

-Success is a matter of preparation and repetition. The material will often require a great deal of time to learn. Use all your learning resources including text, instructor, other students and tutors, if necessary. The course material will build on itself, so do not let any gaps develop in your knowledge. Catching up is nearly impossible once you fall behind.

Chemistry Program Level Student Learning Outcomes

Campuswide information about SLOs is available at www.elcamino.edu/academics/slo

The following activities will be used to assess mastery of student learning outcomes:

-Students will practice safe laboratory procedures by putting their goggles on at the beginning of a chemistry lab experiment involving burners or chemicals, and by keeping their goggles in place during the entire course of the experiment. Students will not remove their goggles until the students are leaving or until the instructor has said that it is safe to do so (whichever comes first).

-On a written exercise, given the names of chemical compounds, students will be able to write the correct reactant formulas, states of matter (when required), identify reaction type, predict the formulas of products, and balance the chemical equation.

Attendance Policy

Attendance at First Class

Students who enroll in class but do not attend the first scheduled class meeting may be dropped from the roster and their places given to waiting students who were unable to enroll at the time of registration.

Attendance Without Official Enrollment

Students will not be permitted to attend classes in which they are not enrolled. Exceptions may be allowed by the instructor for bonafide visitors.

Attendance During Semester

Regular attendance is expected of every student. A student may be dropped from class when absences from class exceed the number of units assigned to the course. This rule also applies to excessive absences due to illness or medical treatment. The student who has been absent due to illness or medical appointment must explain the absence directly to the instructor. The student who has been absent due to a communicable disease or quarantine must report directly to the Health Center for clearance before returning to classes.

Adding a Class

If space is available, students who have completed registration may add a class by going to the first meeting of the class and securing permission of the instructor. Students must follow all college and procedures by the published deadline.

Withdrawal from Class

Official withdrawal from class may be processed through the online system, telephone, or in the Admissions Office. Failure to complete this process may result in the assignment of a letter grade of A through F.

Standards of Conduct

General Policy

Conduct at El Camino College must conform to the laws of the State of California, District policies, and campus rules and regulations. The El Camino College faculty, staff and administration are dedicated to maintaining an optimal learning environment; the standards of behavior as outlined in this policy are essential to the maintenance of a quality college environment. These standards will apply to all students on campus, other college property or while attending any college-sponsored event. Violation of such laws, policies, rules and regulations or behavior adversely affecting suitability as a student, will lead to disciplinary action. Disciplinary actions as noted in Section II may be taken against any person who engages in behavior defined as misconduct as listed.

ADA Statement

El Camino College is committed to providing educational accommodations for students with disabilities upon the timely request by the student to the instructor. A student with a disability, who would like to request an academic accommodation, is responsible for identifying herself/himself to the instructor and to the Special Resources Center.

Tentative Lecture and Lab Schedule, Fall 2009

(Note: this schedule is approximate and is subject to change. Changes will be announced in advance)

Week	Date	Chapter	Lecture or Lab Topic	Lab	Exam
1	M (8/31)				
	T			Safety	Pre. Exam
	W	Chap 1	Matter: Properties and Measurement		
	Th	Chap 2	Atoms and Atomic Theory	Lab Check-in	
2	M (9/7)		Labor Day Holiday		
	T			Exp A – Grav. and Volum. Equipment	
	W	Chap 3	Chemical Compounds (omit 3.7)		
	Th			Exp A (cont)	
3	M (9/14)				
	T			Exp 1-Analysis of Sulfate Ion	
	W				
	Th			Exp 1 (cont)	
4	M (9/21)	Chap 4	Chemical Reactions		
	T			Exp 1 (cont)	
	W				Exam 1
	Th				
5	M (9/28)	Chap 5	Intro. to Reactions in Aq. Solutions		
	T			Exp 17- Ions in Solution	
	W				
	Th			Exp 18- Strength of Ox. and Red. Agents	
6	M (10/5)	Chap 6	Gases		
	T			Exp 18 (cont)	
	W				
	Th			Exp 5 Analysis of KClO₃/KCl	
7	M (10/12)	Chap 7	Thermochemistry		
	T			Exp 5 (cont)	
	W				Exam 2
	Th				
8	M				

	(10/19)				
	T			Exp 2 Calorimetry Hess's Law	
	W	Chap 8	Electrons in Atoms		
	Th			Exp 2 (cont)	
9	M (10/26)				
	T			Exp 3 Atomic Spectra	
	W				
	Th			Exp 4 Sol'n Conc. by Spectrometry	
10	M (11/2)	Chap 9	Periodic Table and Atomic Prop.		
	T			Exp 4 cont	
	W				Exam 3
	Th				
11	M (11/9)	Chap 10	Chemical Bonding: Basic Concepts		
	T				
	W				
	Th			Exp 8 Lewis Structures	
12	M (11/16)	Chap 11	Chemical Bonding: Additional Aspects		
	T			Exp 9 Model Making Geometry	
	W				
	Th			Exp 13 Crystal Lattices	
13	M (11/23)	Chap 12	Liquids, Solids and Intermol. Forces		
	T			Exp 13 (cont)	
	W				Exam 4
	Th		Thanksgiving Break Holiday		
14	M (11/30)	Chap 13	Solutions and their Physical Prop		
	T			Exp 14 Acid Base Titration Pt 1	
	W				
	Th			Exp 14 Acid Base Titration Pt 2	
15	M (12/7)	Chap 16	Acids and Bases		
	T			Exp 16 Strengths of Acids and Bases	
	W				
	Th			Exp 16 (cont)	
16	M (12/14)				
	T			Lab Checkout	Exam 5
	W		Review		
	Th		Final Exam		