

El Camino College
Chemistry 21A: Survey of General and Organic chemistry
Fall 2009 Section 1161

Mission Statement: El Camino College offers quality, comprehensive educational programs and services to ensure the educational success of students from our diverse community.

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Office hours held in the Computer room
Office hours: 15 min before and after class
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Lecture M, W 12:00PM - 01:25PM, Chemistry, Room 105
Lecture Friday 12:00PM - 01:01PM, Chemistry, Room 105
Lab Friday 01:05PM – 03:15PM, Chemistry, Room 166

Course Description: First semester of a two semester sequence designed to provide students with the skills and knowledge needed to satisfy the requirements for several allied health related majors, especially the pre-Nursing major. This course presents the fundamental principals of inorganic chemistry and begins the study of organic chemistry.

Chemistry 21A fulfills the chemistry prerequisite for Biology 1B, Microbiology 33, and Physiology 31, and provides the foundation necessary for success in Chemistry 21B (the second course in the sequence).

CHEM 21A COURSE LEVEL STUDENT LEARNING OUTCOME:

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.

Prerequisites: Mathematics 40 or 41B (Elementary Algebra) with a grade of C or better or equivalent.

Students with disabilities who believe they may need accommodations in this class are encouraged to contact the Special Resource Center on campus as soon as possible to better ensure such accommodations are implemented in a timely fashion. As well please contact me privately to discuss your specific needs.

Required Materials:

1. Textbook: Chemistry for Today: General, Organic, and Biochemistry 6th edition by: Seager and Slabaugh, ,
2. Workbook: Chemistry 21A Packet by Campbell,
3. Lab Book: Exploring Chemistry: Laboratory Experiments in General, Organic, and Biological Chemistry, 2nd Edition by Peller,
4. Safety goggles bought at the bookstore must be approved by instructor
5. Calculator (able to handle exponential notation calculations and logarithms)
6. OPTIONAL: Study Guide and Solutions Manual for Chemistry for Today: General, Organic, and Biochemistry, 6th edition by Seager and Slabaugh's

Classroom etiquette

Come to class prepared, enthusiastic, and ready to learn. Ask questions and participate. Disruptive and disrespectful behavior in the classroom or lab will not be part of our learning environment and will result in dismissal from the class/lab. Any form of cheating on any work will result in a failing grade for the assignment and a report will be filled out with the college administration. Make sure your cell phone is off and pay attention during class and lab.

Attendance

Two late arrivals = 1 absence which will affect your participation grade. It is your responsibility to drop to avoid an "F" grade for the course and make sure you check out of lab with the stockroom attendant.

Last day to add: 9/11/2009 If you get an add form it is your responsibility to turn it in before the deadline.

Last day to drop without a W: 9/25/2009

Last day to drop with a W: 11/19/2009

Useful websites

<http://www.webelements.com>

<http://www.americanelements.com/>

<http://www.elcamino.edu/library/tutoring>

<http://www.creative-chemistry.org.uk/alevel/calculator.htm#formulae>

<http://www.elcamino.edu/faculty/agrant/html/resources.html>

Grade

A: 90%-100%; B: 80%-89%; C: 65%-79%; D: 55%-64%; F: < 54%

Errors in Grading. If there is any error in your grade please see me within one week.

Assessment Activities and approximate distribution of points:

Tests (3 @ 100 points each)	300
Quizzes (7 @ 20 points each)	140
Laboratory (total points)	180
Assignments/Other	50
Participation/Reading quizzes	30
Final Exam	<u>200</u>
Course Total	900

Course Objectives:

By the end of this course, the student will be able to:

1. Use the language of general chemistry (vocabulary, nomenclature, formulas and equations) to describe chemical systems and changes (physical and chemical) they undergo.
2. Describe the structure of the atom in terms of the arrangement of subatomic particles and electronic configuration.
3. Extract information from the periodic table and predict periodic trends.
4. Distinguish between ionic and covalent bonding and write Lewis structure for molecules and polyatomic ions.
5. Predict molecular geometry, bond angles and polarity.
6. Solve introductory level quantitative problems applied to chemical systems by using dimensional analysis and algebra. These problems include unit conversions, stoichiometry, gas laws, solution concentrations and pH.
7. Describe the properties of solids, liquids, gases and solutions and relate them to bonding and intermolecular forces.
8. Discuss the factors which affect the rate of reactions and apply Le Chatelier's Principle to equilibria.
9. State the properties and definitions of acids and bases and interpret elementary acid-base equilibria.
10. Describe the bonding and geometry of carbon compounds in terms of hybridization and type of bonding orbital overlap (pi or sigma).
11. Use free radical, ionic and concerted mechanisms to show how selected organic reactions take place.
12. Determine the nomenclature and write equations for the preparation and important reactions of alkanes, alkenes, alkynes, alcohols and ethers.
13. State the names of common aromatic compounds and describe the structure and resonance of these compounds.

14. Recognize a chiral center in an organic compound, recognize the difference between enantiomers and diastereomers and draw the R or S configuration of an enantiomer using a Fisher projection.
15. Use common laboratory glassware and equipment.
16. State and apply the rules and procedures for laboratory safety.
17. Demonstrate the ability to use basic laboratory skills such as taking and recording observations of chemical systems and interpreting qualitative and quantitative experimental data.

Reading and Homework Assignment

Reading and homework assignments will be given weekly. It is important that you read and do the assigned exercises to assess your progress and to find out the concepts that you are having difficulty with. Before solving the assigned problems, read the corresponding topics from the textbooks. Keep track of your work in order and neatly in a bind notebook so that it will be easy for you to go back and review. Write down your points on the syllabus and calculate your grade after each test.

EXAMINATIONS

- There is no make-up on exams, final, and labs. Exams can be made up only under certain situations with acceptable documentation.
- Students cannot leave during examinations. The memory of programmable calculators must be cleared before taking an exam or quizzes.

LAB

- The experiment must be read before coming to lab. In order to do the lab you must be on time and have a pre-lab write up and pre-laboratory problems completed.
- You must do all your own work and be on time to get full credit. If you come late you will only get half credit.
- Wear instructor approved safety goggles to all labs.
- You are expected to come to lab prepared and on time with lab safety in mind, wearing the appropriate attire and shoes.
- You must be present at the entire pre-lab presentation to be permitted to do the experiment.
- Absences will result in a zero grade for that lab, as will leaving lab early without the permission of the instructor.
- The lab period may be used for problem-solving purposes based on class material on days when the experimental work does not require the whole lab period.
- Students will work individually in lab unless directed otherwise.
- Each student must turn in their individual work. Copying any work will result in a zero points and a referral. All lab reports must be completed by each student individually, even in situations where the experiment was carried out with a partner.
- When working with a partner in lab, you will work together on the same part of the experiment, not individually on separate parts of the experiment.
- Lab reports are due at the end of the laboratory period after the experiment is complete.
- Students are responsible for all glassware and equipment in their lab drawer. Make sure the drawer is latched before locking it.
- No food or drinks at anytime in lab.

Attendance

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. If illness or emergency prevents a student from attending the first class session, the student must contact the instructor. A student who registers for a class and never attends is still responsible for dropping the class. Failure to properly drop a class may result in a “W” and may subject the student for any and all fees associated with the class.

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. Students who attend a class without proper enrollment (the student did not properly register or add the class) by the published deadline will not be permitted to “late add” the class except for documented extenuating and mitigating circumstances.

Attendance During Semester

Students are expected to attend their classes regularly. Students who miss the first class meeting or who are not in regular attendance during the add period for the class may be dropped by the instructor. Students whose absences from a class exceed 10% of the scheduled class meeting time may be dropped by the instructor. However, students are responsible for dropping a class within the deadlines published in the class schedule. Students who stop attending but do not drop may still be retained on the course roster and receive a failing grade. Students may view their registration status using the college’s Web site.

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. It is the responsibility of the student to fulfill all requirements to add a course, and to add the course by the add deadline in accordance with college procedures. Adds will not be processed beyond the add deadline.

Withdrawal from Class

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

Dropping a Class

It is the responsibility of the student to officially drop a class by the deadline date.

Children: are not permitted in the classroom while class is in session.

Food and beverages: are not permitted in the classroom or lab. The only exception is bottled water with a cap in lecture.

Special Accommodations: If you have a documented disability and wish to discuss academic accommodations, please contact me as soon as possible.

***KEEP UP - THERE IS TOO MUCH MATERIAL, AND NOT ENOUGH TIME, TO PLAY CATCH UP ***

El Camino College provides many resources and programs outside of this classroom that can help you to succeed in this class, and in other classes. Below are some of the resources that you might find especially helpful.

1. Counseling: Counselors provide students with academic, vocational, career, and personal support counseling. Academic, vocational, and career counseling through Counseling Services will help you identify and focus on goals and objectives - a significant factor in academic success is having a clearly identified goal and knowledge of what it takes to achieve that goal. Personal support counseling is provided on a short-term basis in Counseling Services, but in greater depth at the Health Center.
2. Learning Resources Center: TUTORING, and basic skills and other assistance.
3. Academic Strategies Course: 1abcd, 20ab, 22ab, 23ab, 25ab, 30ab, 31ab, 33ab, 35ab, 36ab, 40ab, 100. These courses focus on specific skills areas, such as test taking, study techniques, math anxiety, listening and note-taking, problem solving, writing, thinking skills, vocabulary, spelling, memory techniques, sentence punctuation, and learning resources skills development. Mid-term classes are available.
4. Special Resources Center: For physically-, visually-, or hearing-impaired, and learning disability students (including dyslexia, ADD and related). Special tutorials, adapted testing assistance, and other services are available to provide academic and related support to students with disabilities. They provide testing to discover possible learning disabilities, and also for determining your study/learning method strengths and weaknesses.
5. EOP&S Supervised Study: Tutoring and other assistance; only for EOP&S students.
6. Career Services and Transfer Services - Counseling Services: The Career and Transfer Center offers a wide array of services which help to motivate students and give them a clear idea of what they need to achieve goals. Services include a number of workshops on career areas and issues, transfer options, and information about specific universities.
7. Student Enhancement Program (SEP) Workshops in Counseling Services: The SEP workshops are actually a three workshop series, two hours each in duration, and are offered throughout the year. Activities in the workshops help students develop a proactive sense of responsibility for their academic performance and generate solutions to problems affecting their academic performance. Students are referred to on- and off-campus services. Workshop participants are encouraged to form "study partnerships" and study groups. Student feedback has been that workshops do make a difference in their classroom attitudes, motivation, personal confidence, and study behavior. Students discuss problems, formulate action plans, engage in exploration of resources, and report back to their group their findings and actions taken.

TENTATIVE LECTURE & TEST SCHEDULES AND ASSIGNMENTS

Day/Date

M 08/31

CHAPTER/TOPIC/WORKSHEETS

Course Overview; **Chapt 1**: Matter, Measurements, and Calculations;

W 09/02		Chapt 1 , cont'd: Properties and Changes; : Classification of Matter
F 09/04		Chapt 1 , cont'd; Measurements and the Metric System;
M 09/07	Holiday	
W 09/09	Q 1	Chapt 1 , cont'd: Measurements and the Metric System;
F 09/11		Chapt 1 , cont'd: Density and Specific Gravity
M 09/14		Chapt 2 : Matter, Atoms and Molecules; Important Elements and Their Symbols;
W 09/16	Q 2	Chapt 2 , The Periodic Table
F 09/18		Chapt 3 : Electronic Structure and the Periodic Law
M 09/21		Chapt 3 , cont'd: Electron Configurations;
W 09/23	Q 3	Chapt 3 , cont'd: Property Trends; Formula Writing Practice
F 09/25		Chapt 4 : Forces Between Particles; Charges of Simple Ions;
M 09/28		Chapt 4 , cont'd: Covalent Bonding;
W 09/30	Q 4	Chapt 4 , cont'd: Lewis Electron Dot Diagrams; Polyatomic ions;
F 10/02		Chapt 4 , cont'd: Polarity of Covalent Molecules
M 10/05	T 1	TEST I
W 10/07		Chapt 5 : Chemical Reactions; Equation Writing;
F 10/09		Chapt 5 , cont'd: Types of Reactions; Redox Rxns;
M 10/12		Chapt 5 , cont'd: the Mole and Chemical Equations (omit Sec 5.10);
W 10/14		Chapt 5 , cont'd; Stoichiometry Worksheet
F 10/16		Chapt 6 : The States of Matter;
M 10/19	Q 5	Chapt 6 , cont'd: the Gas Laws (omit Sec 6.10);
W 10/21		Chapt 6 , cont'd; Gas Law Worksheet;
F 10/23		Chapt 6 , cont'd: Changes in State
M 10/26	Q 6	Chapt 7 : Solutions (and Colloids – but omit Sec 7.6, 7.8, 7.9);
W 10/28		Chapt 7 , cont'd; Solutions Worksheet;
F 10/30		Chapt 7 , cont'd: Solution Properties
M 11/02	T 2	TEST II
W 11/04		Chapt 8 : Reaction Rates and Equilibrium;
F 11/06		Chapt 8 , cont'd: Chemical Equilibrium;
M 11/09		Chapt 8 , cont'd: Factors that Influence Equilibrium Position
W 11/11		Chapt 9 : Acids, Bases, and Salts;
F 11/13	Holiday	

TENTATIVE LECTURE & TEST SCHEDULES AND ASSIGNMENTS, cont'd

<u>Day/Date</u>		<u>CHAPTER/TOPIC/WORKSHEETS</u>
M 11/16		Chapt 9 , Buffer Problems
W 11/18	Q 7	Chapt 11 : Organic Chemistry: Alkanes ; Functional groups;
F 11/20		Chapt 11 , cont'd: Structure/Isomerism; Organic Nomenclature;
M 11/23		Chapt 11 , cont'd: Organic Nomenclature;
W 11/25		Chapt 11 , cont'd: Cycloalkanes;
F 11/27	Thanksgiving	26-29
M 11/30		Chapt 11 , cont'd: Alkane Reactions

W 12/02	T 3	TEST III
F 12/04		Chapt 12: Unsaturated Hydrocarbons;
M 12/07		Chapt 12 , cont'd: Properties of Alkenes; Alkynes Chapt 12: Aromatic Cmpds; Stereochemistry
W 12/09	Q 8	Chapt 13: Alcohols, Phenols, and Ethers;
F 12/11		Chapt 13 , cont'd;
M 12/14		Chapt 13 , cont'd: Reactions of Alcohols and Phenols;
W 12/16	FE	FINAL EXAM, Part 1;
F 12/18	FE	FINAL EXAM, Part 2

FINAL EXAM:

WEDNESDAY, DECEMBER 16 (PART 1 – written – all material through Dec 11)

AND

FRIDAY, DECEMBER 18 (PART 2 – multiple choice: ALL COURSE MATERIAL)

LABORATORY SCHEDULE

<u>DATE</u>	<u>EXPERIMENT or TOPIC/WORKSHEETS</u>
F 09/04	Continues Lecture: Measurement / Sig Figs / Metric Conversion Exp 1: Metric Lab
F 09/11	Check-in; Expt 2: Lab Measurements and Graphing
F 09/18	Expt 3, part 3: Physical Properties of Inorganic Substances: Density
F 09/25	Expt 5: Names and Formulas of Chemical Compounds
F 10/02	Lab Safety; Read Expt 1 BACKGROUND; Expt 6: Lewis Dot Structures and Molecular Models
F 10/9	Expt 7: Chemical Reactions and Their Classification
F 10/16	Expt 12: Formulas of Hydrates
F 10/23	Expt 10: Collection and Measurement of Hydrogen Gas
F 10/30	Continuation of lecture - no lab experiment scheduled
F 11/06	Expt 6-2 (Hand-out): Solution Chemistry
F 11/13	Expt 9: Equilibrium Systems
F 11/20	Expt 13: Acids, Bases, pH, and Indicators

F 11/27	Thanksgiving
F 12/04	Expt 18: Hydrocarbons (Models)
F 12/11	Expt 19: Reactivity of Hydrocarbons
F 12/18	Check-out, FINAL EXAM