Chemistry 1A: General Chemistry

Fall 2008 – Section 1194

Instructor: Valerie Baggett

Office: CHEM 132

Office Hours: MW 12:30 – 1:00 pm

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Class Hours:	MW	11:00 – 12:25 pm	CHEM 103	lecture
	TTh	2:00 – 5:10 pm	CHEM 165	lab

Course Description: Chemistry 1A is a 5 unit class and is the first semester of the General Chemistry series. It covers fundamental theory and principles of atomic and molecular structure, physical sates and chemical reactions. These include measurements, dimensional analysis, matter, inorganic and organic nomenclatures, modern atomic theory, chemical bonds, molecular polarity / non polarity, intermolecular forces, crystalline solid state, chemical reactions, thermodynamics, chemical calculations, ideal gases and real gases, solutions, chemical equilibrium, theories and strength of acids and bases.

Prerequisite: 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 Materials:

Nivaldo Tro, *Chemistry, A Molecular Approach*, by Nivaldo Tro, ©2008.

Scroggins, *Chemistry 1A Laboratory Experiments*.

A scientific calculator, capable of doing exponential (exp or EE key) and logarithmic calculations.

Safety goggles (Instructor approved)

USB flash drive, 128 MB or higher

Optional Materials:

Nivaldo Tro, *Selected Solutions Manual for the required text*. (This manual has the worked solutions for all the odd numbered problems in the text.)

Grading:

Three Exams @ 100 points each	=	300 points (43%)
Five Quizzes @ 10 points each	=	50 points (7%)
Fifteen Labs @ 10 points each	=	150 points (21%)
Five Unknowns @ 5 points each	=	25 points (4%)
Lab Participation	=	25 points (4%)
Student Presentations	=	50 points (7%)
Final	=	100 points (14%)
Total Points for Course	=	700 points (100%)

%	*Points*	*Grade*
90 - 100	630 - 700	A
80 – 89	560 - 629	B
70 – 79	490 - 559	C
60 – 69	420 - 489	D
0 – 59	0 - 419	F

Exams - There are four mid-term exams, each worth 100 points. Exam questions will be similar to the homework problems. On calculation problems, partial credit is given if the work is shown. The lowest exam grade will be dropped. There are no makeup exams.

Homework – The homework includes the following for each chapter:
"For Practice" problems, all
"Problems by Topic" odd numbers, only
"Cumulative Problems" odd numbers, only
"Conceptual Problems" all
All of the homework can be handed in before each exam for 5 extra credit points. Partial credit is not given if not all the homework has been completed. All logical steps must be shown for all calculation type of problems to receive credit.

Quizzes – Quizzes will be announced.

Labs – There are 16 scheduled labs. There are no make-up labs. The lowest lab will be dropped. The pre-lab assignment is to be finished before coming to lab. If it is not complete, a 2-point deduction will be taken on the lab. All labs reports are due one week after the lab is completed.

Student Presentations – Details will be provided later.

Final – The final is a cumulative exam.

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.

6. Determine oxidation numbers; balance oxidation-reduction equations; identify oxidizing and reducing agents.

7. Apply the First Law of Thermodynamics; relate ΔE to ΔH; calculate ΔH through calorimetry, Hess' Law, enthalpy of formation, and bond energies.

8. 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.

9. 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.

Expectations of Students:

1. Students will be in class at the start of class every day, will stay for the whole class, and will attend every class and laboratory.

2. Student will notify the instructor if they are going to miss class. This can be done in person, by e-mail, or by a phone call in an emergency situation.

3. Students will be prepared when they come to class and lab. Students are expected to read the chapter before coming to lecture, and read the experiment and complete the pre-lab exercises before coming to lab.

4. Students will complete the lab during the scheduled time.

5. PowerPoint presentations are available to students during the lab time, and can be downloaded onto a flash drive.

6. Students will do the assigned homework. It is best to do the homework the same day as the lecture. (This is a 5 unit class, so it must be assumed that homework will take at least 10 hours per week.)

7. Students will not disrupt the class with cell phones, late arrivals, excessive noise, eating and drinking, etc.

8. Students will clean up their own messes.

9. Students will not cheat or plagiarize. This includes copying someone else's lab report or lab data.

10. Students will ask questions in class, of other students, and of the instructor. Questions are encouraged as long as they relate to the lecture subject. Sincere questions are never stupid and you will not be ridiculed or degraded for asking them.

11. Students will form study groups and help each other learn.

12. Students will follow laboratory safety procedures, including wearing goggles, no food or drink, and wearing closed-toe shoes.

13. Students will notify the instructor of a medical condition or disability which may prevent the student from compliance with the course syllabus.

Proposed Lecture and Lab Schedule

Week	Date	Day	Lecture	Lab
1	08/25	M	Introduction	
	08/26	Tu	Chapter 1 – Matter, Meas . . .	
	08/27	W	Chapter 2 – Atoms and Elements	
	08/29	Th		Scientific Method / handout
2	*09/01*	*M*	***Labor Day - no school***	
	09/02	Tu		Lab safety, check-in, quiz
	09/03	W	Chapter 2 – Atoms and Elements	
	09/04	Th		Exp A – Gravimetric and Volumetric Equipment
	09/05	*F*	*Last day to add / drop with refund*	
3	09/08	M	Chapter 3 – Molecules, etc.	
	09/09	Tu		Exp14 – Acid/Base Titration I (Prelab)
	09/10	W	Chapter 3 – Molecules, etc.	
	09/11	Th		Exp14 –Acid/Base Titration II
4	09/15	M	Chapter 4 – Chemical Quantities	
	09/16	Tu		Exp 17 – Ions in Solution
	09/17	W	Chapter 4 – Chemical Quantities	
	09/18	Th		Exp 18 – Oxidation-Reduction (Pre-lab)
	09/19	*F*	*Last day to drop with no record.*	
5	09/22	M	Chapter 4 – Chemical Quantities	
	09/23	Tu		Exp 18 – Oxidation-Reduction
	09/24	W	Chapter 15 – Acids and Bases	
	09/25	Th		**Exam 1, Chapters 1, 2, 3, 4**

Week	Date	Day	Lecture	Lab
6	09/29	M	Chapter 15 – Acids and Bases	
	09/30	Tu		Exp 16 – Strength of Acids and Bases (Prelab)
	10/01	W	Chapter 5 - Gases	
	10/02	Th		Exp 7 – Molar Mass of Carbon Dioxide / handout (Prelab)
7	10/06	M	Chapter 5 - Gases	
	10/07	Tu		Exp. 5 – Analysis of Mixture (Prelab)
	10/08	W	Chapter 6 - Thermochemistry	
	10/09	Th		Excel Lab / handout
8	10/13	M	Chapter 6 - Thermochemistry	
	10/14	Tu		Exp 2 – Hess' Law (Prelab)
	10/15	W	Chapter 6 - Thermochemistry	
	10/16	Th		Exp 2 – Hess' Law
9	10/20	M	Chapter 7 – Quantum Mechanics	
	10/21	Tu		**Exam 2 – Chapters 5, 6, 15**
	10/22	W	Chapter 7 – Quantum Mechanics	
	10/23	Th		Exp 3 – Atomic Spectra (Prelab)
10	10/27	M	Chapter 8 – Periodic Properties	
	10/28	Tu		Exp 1 – Gravimetric Determination (Prelab)
	10/29	W	Chapter 8- Periodic Properties	
	10/30	Th		Exp 1 – Gravimetric Determination
11	11/03	M	Chapter 9 – Chemical Bonding	
	11/04	Tu		Exp 4 – Solution Conc by Spectro / handout (Prelab)
	11/05	W	Chapter 9 – Chemical Bonding	
	11/06	Th		Exp 8 – Lewis Structures

Week	Date	Day	Lecture	Lab
12	*11/10*	*M*	***Veteran's Day – no school***	
	11/11	Tu		**Exam 3 – Chapters 7, 8, 9**
	11/12	W	Chapter 10 – Chemical Bonding	
	11/13	Th		Exp 9 – Geometry
	11/14	*F*	*Last day to drop with a "W"*	
13	11/17	M	Chapter 10 – Chemical Bonding	
	11/18	Tu		Exp 10 – Organic / handout
	11/19	W	Chapter 11 – Liquids, Solids	
	11/20	*Th*		Exp 13 – Crystal Lattices / Metallic (Prelab)
14	11/24	M	Chapter 11 – Liquids, Solids	
	11/25	Tu		Exp 13 – Crystal Lattices / Ionic
	11/26	W	Chapter 12 - Solutions	
	11/27	Th		***Thanksgiving – no school***
15	12/01	M	Chapter 12 - Solutions	
	12/02	Tu		Internet Research
	12/03	W	Chapter 20 - Nonmetals	
	12/04	Th		**Exam 4 –Chapters 10, 11, 12**
16	12/08	M	Student presentations	
	12/09	Tu	Student presentations	Lab Checkout
	12/10	W	Students presentations	
	12/11	Th		**Final Exam - Cumulative**

Web-based Materials:

1. Website for book:

http://wps.prenhall.com/esm_tro_chemistry_1/

Student Information

Name: _____

Phone Number: _____

E-mail address: _____

Most recent chemistry course taken:

Course name _____ When taken _____

Most recent math course taken:

Course name _____ When taken _____

Why are you taking Chem 1a?

Describe previous college experience.

Something that you would like to tell me about yourself.

Acknowledgement of Syllabus:

By signing and returning this sheet, I acknowledge that I have read the El Camino College Chemistry 1A - Section 1194 Syllabus for Fall 2008 and that I have understood all of its contents.

_____ _____

Signature Printed full name