Orange County Community College
Department of Science & Engineering
37110 Elements of Chemistry and Physics

Fall 2006

A survey of the fundamental principles of chemistry and related physical laws. Only elementary mathematics is used. Topics include: safety in the laboratory, measurement, atomic structure, the periodic table, chemical equations, solutions, electrolytes, acid-base reactions, pH, the gas laws, main organic functional groups, introductory biochemistry, nuclear physics and an introduction to mechanics.

Instructor: Cynthia MacMahon
Office: HO-3B
e-mail: cmacmaho@sunyorange.edu
Phone: 341-4576
Office hours: **See hours on office door.**
I will be around most of the week.
Students can drop by or make appointments to see me either during the posted office hours or outside of these hours. If you are having trouble or just have questions, please stop by and see me.

TEXT: Chemistry: An Introduction to General, Organic, and Biological Chemistry
Ninth Edition

Author: Karen Timberlake

Materials: Scientific calculator, notebook, goggles, willingness to learn.

Relationship to Programs:

Chemistry 37110 is designed to give an introductory examination of inorganic chemistry, organic chemistry, and an introduction to mechanics.

Course Objectives:

The student who successfully completes this course will:

- Determine the number of significant figures in a measured value.
- Convert numbers from within the metric system and between the English and metric systems.
- Calculate the density and specific gravity of a substance and use these to calculate the mass or volume of a substance.
- Name and give formulas for both ionic compounds and covalent molecules.
- Understand matter, energy, bonding, the gas laws, balancing chemical equations and simple organic chemistry.
- Solve simple stoichiometric problems.
- Calculate Molarity and % for a solution.
- Describe the dilution of a solution.
- Calculate pH, pOH, $[H_3O^+]$ and $[OH^-]$ given one of them using log and antilog.
- Perform experiments and draw conclusions based on the experimental data.
- Develop thinking skills that will help in the rest of your college life and life in general.
- Be aware of and confident about your skills as a student and as an effective thinker.

Attendance/Withdrawal Policy:

Attendance is mandatory. Without proper attendance a student will not do well in this course. **Since chemistry is an experimental science, anyone who misses three or more labs in the semester will automatically receive an F for the course**. If you are late to lab, it counts as 1/3 of a missed lab. Labs cannot be made up. To be successful in chemistry one must pay attention in lecture and conscientiously do the homework. It is the student's responsibility to ensure that she/he is

doing well in this course. Note, Friday November 3rd is the last day for a student to withdraw from a course with a grade of W. If you are in need of special accommodations owing to a disability, please see the instructor.

Extra Help

There is tutoring available on a limited basis for this course. The tutorial center is located on the second floor of the LRC. If you are in need of special accommodations owing to a disability, please see the instructor**.**

Lecture Schedule

Date	Topic	Chapter/Section	Lab
8/28/06	Introduction; Measurements	1.1, 1.4	Math
Week # 1			Review
9/5	**No Classes on Labor Day Monday**		
	Unit Conversions, Significant Figures, Matter		
	Density / Specific Gravity	1.5-1.7	Instrument
Week # 2	Temperature scales	2.3	Reading
9/11	Specific Heat and Calories/Joules	Chapt 2	Density
Week #3	Heating Cooling Curves		
9/18	The Periodic Table; Protons, Neutron, and Electrons	3.1-3.8	Calorimetry
Week # 4	Valence Electrons; Ionic Bonds and Compounds	4.1-4.2	
9/25	**TEST ONE**	********	Periodic
Week # 5	Polyatomic ions, naming of compounds	4.3-4.5	Table
10/2	The Mole, Chemical reactions	5.5-5.8	Nomenclature
Week # 6	Stoichiometric calculations		
10/10	**Monday Classes 10/9 will be held on Tuesday**		
	The Gas Laws / Boyles Law	6.1 – 6.8	Phys/Chem
Week # 7	Properties of Gases; The Gas Laws		Properties*
10/16	**TEST TWO**	********	Gas Laws
Week # 8	Properties of Solutions, %, Molarity (M), Osmotic Pressure	7.1 - 7.5	Boyle's Law
10/23	Solutions Continued	7.5-7.7	Known
Week # 9	Acids and Bases, pH, pOH, calculations	8.1- 8.5	Conc.
10/30	Acid-Base reactions; Buffers	8.6-8.7	Solubility
Week # 10			
11/6	Nuclear Physics: Radioactivity and Nuclear Stability	9.1-9.4	Titration*
Week # 11	Radioactivity	9.5-9.6	
11/13	**TEST THREE**	********	Radioactivity
Week # 12	Introduction to Organic	10.1-10.2	
11/20	Cycloalkanes; Unsaturated Hydrocarbons	10.3 11.1	*********
Week # 13			
11/22-26	**Thanksgiving Recess**		
11/27	Alcohols, Phenols, Ethers, Thiols	12	Organic I
Week # 14	Continued	13	
12/4	Finals	Handout	Review
Week # 15	Pulleys	Handout	
12/11-14	**Final Exam Week**		

*** You will need goggles for these labs**

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GRADING:

3 Tests	=	16% Each
1 Final	=	16% Total
Quizzes	=	16% Total
Lab	=	20% Total
Total %	=	100 %

Grade distribution: 100%-90% [A]; 89%-80% [B]; 79%-70% [C]; 69%-60% [D]; < 60% [F]

Quizzes will be based almost exclusively on homework. Quizzes cannot be taken late, but they may be taken early. The lowest quiz grade will be dropped before the average is calculated at the end of the semester. Labs cannot be made up. Any missed labs will receive a grade of zero. Tests will also be based on the homework with the possibility of some multiple-choice questions.

There are many homework handouts that I will be given out throughout the semester. In addition to these handouts, the following are problems found in the book that may help in your understanding of the material.

Homework Problems from Timberlake's Chemistry: An Introduction to General, Organic And Biological Chemistry, eighth Edition

Homework: [All Study Check problems and the Odd numbered problems have answers in the back of the chapter]

CHAPTER	PROBLEMS
1	3,5,7,9,11,15,17,19,25,29,39,41,43,45,47,49,51,53,55,57,59,61,63,67,69,73,75
2	13,15,49
2	3,5,19,21,25,27,29,31,33,35,37,51,53,54
3	1,3,5,7,9,11,13,15,17,19,21,31,33,35,37,39,41,47,53,55
4	3,5,7,11,13,15,17,19,21,23,25,29,31,33,35,37,39,43,47,49,79,81,83
5	21,23,25,27,29,31,33,37,43,45,47,49,53,57,59,61,,69,75,77,79,81,85
6	7,11,13,15,19,23,27,35,41,43,49,51,77
7	1,5,7,,9,21,23,31,33,35,37,39,43,45,47,49,53,55,67,69,93,97,99
8	1,3,5,7,11,13,27,29,31,33,35,37,39,41,43,45,47,51,57,63,67
9	3 ,5,7,9,13,15,17,19,23,29,31,33,35,37,41,43,45, 53,55,59,63,65
10	1,3,5,7,9,11,13,15,1719,21,27
11	1,3,5,7
10-13	See laboratory hand out

Levers and Pulleys: Homework is handed out in class.