

Chemistry 151
Fundamentals of Chemistry I
Winter 2005

Instructor: Dr. Gregorio Santillan
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Schedule: TR 11:45 am-1:00 pm

Location: PS 158

Office Hours: MWF 11-12 noon, TR 1:30-2:30 pm

Course Objectives: This course is designed to introduce the fundamentals of chemistry which can ultimately be applied your work places and in your everyday lives.

Required Textbook and materials:

Chemistry and Life. J.W., D.M. Feigel and S.J. Baum, Sixth ed., Prentice Hall.
Study Guide for Chemistry and Life.

Chemistry 151 Lab Manual, Horowitz and Manatt.

- Periodic Chart
- Scientific calculator

Ability access the Chemistry department web site:
<http://www.calstatela.edu/dept/chem/05winter/151/>

General Comments

The laboratory is an integral part of this class. Failure to complete the laboratory experiments will result in an unsatisfactory grade in the class.

You will have to work numerical problems to pass this class. This implies that you are expected to be familiar with algebraic equations, roots, logs, and exponents. You are required to have a scientific calculator.

Chemistry cannot be learned by memorizing or cramming the night before an exam. Each new topic is based on topics previously covered. **Please read the assignments by the time indicated in the syllabus prior to coming to class.**

There will be problem assignments to be completed each week. Solving them will tremendously help you during the exams. At times, you may be asked to present the solution to the class. The purpose of this activity is to enhance your cooperation skills as well as your understanding of the material.

Every ten days to two weeks, there will be a short quiz (15-20 min). The questions on these quizzes will be somewhat similar to the ones asked during the tests.

Grading

Lecture quizzes: 100 Points
Five quizzes each worth 25 points. Lowest score will be dropped.

Midterms: 300 Points
Two midterms 150 points each.

Final Exam (comprehensive, March 15, 10:45-1:15 am) 250 Points

Laboratory Points 350 Points

Total: 1000 Points

The grading scale will be the absolute scale shown below. You are not competing against anyone in this class. Your individual effort will determine your final grade.

1000-850 points A

700-849 points B

550-699 points C

300-549 points D

299 points or less F

The course will be graded +/- . Usually, ten points of the cut-of line for a given grade will result in either a + or a – type grade.

| Course Outline Date | Topic | Required Reading |
|------------------------|---|------------------|
| 1/4 | Scientific Methodology. Elements Chemical & Physical Change. The Metric System. | pp. 1-32 |
| 1/6 | The atom-different methods | pp. 38-50 |
| 1/11 | Electron Configurations Periodic Table | pp. 50-63 |
| 1/13 | The Octet Rule, Ionic Bonds | pp. 68-76 |
| 1/18 | Covalent Bond, Lewis Dot Structures | pp. 77-81 |
| 1/20 | Electronegativity, Polarity | pp. 81-92 |
| 1/25 | Chemical Equations | pp. 98-103 |
| 1/27 | MIDTERM # 1 | |
| 2/1 | Avogadro's number. The mole. | pp. 103-107 |
| 2/3 | Molarity and chemical equations | pp. 107-112 |
| 2/8 | Exothermic and endothermic reactions Chemical equilibrium. | pp. 113-123 |
| 2/10 | Oxidation and reduction | pp. 129-146 |
| 2/15 | Gases | pp. 150-170 |
| 2/17 | Intermolecular forces. Hydrogen Bond | pp. 175-194 |
| 2/22 | Solutions. Acid and Bases-introduction | pp. 198-224 |
| 2/24 | MIDTERM # 2 | |
| 3/1 | Acid and Bases II | pp. 225-240 |
| 3/3 | Acid and Bases III | pp. 224-266 |
| 3/8 | Radioactivity and Applications | pp. 306-325 |
| 3/10 | Review | |
| 3/15 | Final Exam | |

Chemistry 151 Recitation/Laboratory

Breakage card:

Every student is required to buy a \$10.00 breakage card from the Cashier's Office. The Breakage card must be turned into the Chemistry stockroom by the end of the second week. This must be done before the student is issued a locker combination.

Safety:

All safety is strictly enforced.

Supplies:

Safety glasses; case-hardened industrial quality, or goggles are required.

Normal prescription glasses are not satisfactory.

It is advisable for each student to wear an apron or lab coat as both a safety precaution and protecting clothing.

Closed-toe shoes are required, no sandals will be allowed.

Quizzes:

Will be given during the recitation. These short quizzes will cover topics which have been previously discussed in the lab and pre-lab for that week.

Recitation:

Each week assigned problems should be solved and turned in on their due dates.

During the recitation, the problems and the lab experiment will be discussed.

Reports, Prelabs and Data:

A prelab should be prepared before coming to class. It should include the title of the experiment, purpose, and the experimental procedures. Your instructor can grade the prelab instead of administering the quiz for three weeks. The prelab and all the data should be recorded in your lab notebooks. Your lab notebooks should be the standard bound quadirule (5 by 5, 96 sheets) with non-detachable pages.

Your reports should include: Title of the experiment, Date the experiment conducted, Partner's names, Purpose of the experiment, Principles, Procedure, Data, Conclusion/Discussion, Answers to questions from the lab manual. Lab reports are due a week from the completion of the experiment, points will be deducted if they are turned in late.

Laboratory Grading:

Quizzes 80 points, Participation/Safety 20 points, Reports 190 points, Recitation 60 points.

Laboratory Schedule

| Week | Experiment |
|-------------|---|
| 1 | Check in, Significant figures, Unit conversions |
| 2 | Weight Measurement; Elements and compounds 20 points |
| 3 | Determination of Density 25 points |
| 4 | Molecular Models, Chemical Formulas and Reactions 25 points |
| 5 | Determination of an Empirical Formula 25 points |
| 6 | Percent Water in Copper Sulfate 20 points |
| 7 | Molar volume 25 points |
| 8 | Acid-Base Titrations 25 points |
| 9 | pH and Buffers 25 points |
| 10 | Check out |

Homework Assignments

| <u>Set</u> | <u>Week Due</u> | <u>Assignment</u> |
|-------------------|------------------------|--|
| 1 | 2 | Chapter 1: 1, 3, 7, 15, 19, 20, 21, 23, 26, 33-35, 42, 51, 56, 62, 67 Topic A (optional): 3, 6, 7 |
| 2 | 3 | Chapter 2: 4, 10, 11, 13, 16, 20, 22, 32, 36, 43, 44, 57 |
| 3 | 4 | Chapter 3: 7-12, 13-28, 46, 48, 52, 68 |
| 4 | 5 | Chapter 4: 1-4, 6-9, 14, 16, 18, 20, 41-43, 46, 55 Topic B (optional): 1, 3, 6, 11 |
| 5 | 6 | Chapter 5: 1-6, 8, 10, 18, 22, 26 |
| 6 | 7 | Chapter 6: 1-4, 6, 8, 12, 14, 18, 22, 24, 30, 38, 46 Chapter 7: 2, 4, 6, 8, 12, 16, 20, 26-28 |
| 7 | 8 | Chapter 8: 2, 4, 6, 8, 10-15, 22, 24, 26, 28, 34, 41-45 |
| 8 | 9 | Chapter 9: 4, 6, 8, 10, 22, 24, 26-30, 37, 40, 41 Chapter 10: 2, 4, 6, 8, 10, 22-28, 38, 40, 44, 50, 54 |
| 9 | 10 | Chapter 12: 4, 6, 12, 16, 18 Topic C (optional): 1, 4, 6, 14 |