

GENERAL CHEMISTRY, CHEM-1B, WINTER 2009
INSTRUCTOR: DR. RAM SUBRAMANIAM, SECTIONS: 01 AND 02

Instructor Contact Information

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Office Hours: MWF- 10:30 to 11:30 a.m.; other times available by appointment

Class Meeting

Lecture: SC1102
Lecture time: Monday, Wednesday, and Friday: 12:30 to 1:20 p.m.

Lab lecture and Lab: SC 2204
Lab lecture and Lab time: Section 1- 7:30 to 10:00 a.m. and Section 2- 2:30 to 5:00 p.m.

Textbook

Lecture- General Chemistry: Principles and Modern Applications, 9th edition; by Petrucci, Harwood, Herring, and Madura (Prentice Hall: 2007; ISBN 0-132-38826-X)

Lab- Microscale General Chemistry Laboratory, 2008; De Anza edition, Szafran, Pike, Foster (John Wiley & Sons: 2008, ISBN 0-471-77762-5)

Course Content

In this second General Chemistry course, we will discuss chapters 12-19 of the textbook. We will begin with a discussion about intermolecular forces in liquids and solids and continue to discuss physical properties of solutions. Following this we will learn about rates of chemical reactions and the parameters that affect the rates of reactions. We will then delve into an extensive discussion on the principles of chemical equilibrium and its relevance to acid-base chemistry and solubility of substances. Finally we will examine the thermodynamics of such reactions and introduce the concepts of free energy and entropy of chemical reactions.

Academic Integrity

All graded assignments must be completed without any consultation (people, books, internet) unless otherwise permitted by the instructor. Any student that violates this policy will receive a failing grade (F) in the class and reported to appropriate administrative authorities such as the Dean.

Attendance Policy

You are expected to attend all lecture and laboratory classes. Strong evidences exist that indicate that the success of a student is directly related to her/his class attendance. You will be given an "F" grade for unexcused absences in THREE or more lectures.

Excused Absence: If you know in advance that you will need to miss a class, please notify the instructor and provide proof of the excuse. If you have already missed a class, please follow up with the instructor as soon as possible and provide a proof of a valid excuse. Valid excuses are: birth/death in the family, work-related travel, illness/medical emergencies, conference travels, jury duty, accidents, legal issues, or traveling to represent De Anza College at meetings/other events. Other excuses will be considered on a case-by-case basis. Please note that verifiable documented proof of the excuse is essential in order to grant a make-up.

Evaluation

The lecture portion of the class is weighted at 70% and the laboratory portion is 30%. There will be three exams, four quizzes, and a final exam in the lecture. Of the four quizzes, the lowest score will be dropped. There are a total of nine laboratory experiments. You must complete all the lab experiments in order to pass the class. The evaluation for the laboratory part will consist of lab reports, lab exams, attendance, and notebook.

Lecture Schedule

The following is a tentative schedule for the lecture portion of the class. It is highly recommended that you read the relevant sections in the book prior to the lecture. On the days of the exams, the full lecture period will be used for the exam. Periodically, the instructor may assign certain sections of the book to be read on your own and these will not be covered in the lecture. You will receive appropriate instruction for such readings during the lecture. Some laboratory periods may be used for lectures.

Class Period	Topics	Sections
1/5	Introduction, syllabus	
1/7	Properties of liquids	12.1-12.2
1/9	Properties of solids	12.3-12.5
1/12	H-bonding	12.6-12.7
1/12	Crystals (during lab lecture)	12.8-12.9
1/14	Quiz 1 Solution concentration	Chapter 12 13.1-13.2
1/16	Intermolecular forces	13.3-13.5
1/19	<i>Martin Luther King Day (college closed)</i>	
1/21	Vapor pressure, osmotic pressure, colligative properties, electrolytes, colloids (during lab)	13.6-13.10
1/23	Rate of a reaction	14.1-14.4
1/26	Quiz 2 First order reaction	Chapter 13 14.5
1/28	Second order reaction	14.6-14.8
1/30	Temperature effect, reaction mechanism	14.9-14.10
2/2	Catalysis (lab lecture)	14.11
2/2	Equilibrium constant	15.1-15.4
2/4	Exam 1	Chapters 12-14
2/6	Reaction quotient, Le Chatelier's principle	15.5-15.6
2/9	Equilibrium calculations (lab lecture)	15.7
2/9	Acids and Bases	16.1-16.4
2/11	Weak acids and bases (lab lecture)	16.5
2/13	<i>President's day weekend (college closed)</i>	
2/16	<i>President's day weekend (college closed)</i>	
2/18	Polyprotic acids, pH of salts	16.6-16.7
2/20	Molecular structure, Lewis acids/bases	16.8-16.9
2/23	Quiz 3 Common ion effect	Chapter 16 17.1
2/25	Buffers, Indicators, Titrations (lab lecture)	17.2-17.4
2/27	Titrations	17.5
3/2	Exam 2	Chapters 16-17
3/4	Solubility	18.1-18.4
3/6	Precipitation	18.5-18.7
3/9	Qualitative analysis	18.8-18.9
3/11	Quiz 4 Spontaneity	Chapter 18 19.1-19.2
3/13	Change in entropy	19.3
3/16	Second law of thermodynamics	19.4-19.5
3/18	Free energy and equilibrium	19.6
3/20	Temperature effect and coupled reactions	19.7-19.8
3/23	Exam 3	Chapters 18-19

Grading

<i>Lecture: 700 points</i>	
<i>Exams</i>	$3 \times 100 = 300$ points
<i>Quizzes</i>	$3 \times 50 = 150$ points
<i>Final Exam</i>	$1 \times 250 = 250$ points

<i>Lab: 300 points</i>	
<i>Short report</i>	$7 \times 10 = 70$ points
<i>Long report</i>	$2 \times 25 = 50$ points
<i>Lab exam</i>	$2 \times 75 = 150$ points
<i>Attendance</i>	20 points
<i>Notebook</i>	10 points

Grading Scale

In order to obtain the final letter grade for the class, your total lecture score will be added to your lab score and a percentage score will be computed based on the total. This percentage score will be rounded to the nearest whole number and a letter grade will be assigned as per the following table. Grades will not be based on a curve. Please note that regardless of your overall score, if you do not complete all the lab assignments you will receive an F grade in the class.

<i>Percentage points</i>	<i>Grade</i>
95-100	A+
90-94	A
87-89	A-
84-86	B+
80-83	B
77-79	B-
73-76	C+
70-72	C
66-69	D+
63-65	D-
0-59	F

Other Options

Pass/No Pass: A grade of “C” or higher is considered “Pass” in the course and lower than “D+” is considered “No Pass” in the course.

Audit: If you do not need any credit for this course, you may elect to audit the course.

Note: You are not permitted to attend this class if you are not officially registered.

Important Dates

Date	Activity
1/14/2009	Quiz 1
1/17/2009	Add a course
1/16/2009	Drop a course with a refund
1/26/2009	Quiz 2
1/24/2009	Drop a course with no grade record
1/30/2009	Designate a course Pass/No Pass
2/4/2009	Exam 1
2/23/2009	Quiz 3
3/2/2009	Exam 2
3/11/2009	Quiz 4
3/23/2009	Exam 3
11/11/2008	Exam 3
3/27/2009	Final Exam: 11:30 a.m.-1:30 p.m.

Lab

Safe lab practices are of utmost importance. Please read the section in your laboratory on safety issues carefully. The following rules are applicable while in the lab:

- You may not be in the laboratory unless an instructor is present
- Notify the instructor immediately in cases of illnesses while in the lab
- Eating and drinking are strictly prohibited inside the lab
- Open-toed shoes and shorts are not permitted inside the lab
- Personal headphones may not be used while in the lab
- Dispose off waste material and broken glassware as per instructions from your instructor
- Safety goggles must be worn at all times

The lab instructor will provide more detailed information regarding the lab reports as well as the lab exams to you.

The following is a schedule of experiments that will be performed this quarter. Prior to start of a particular lab, you must complete the pre-lab exercise and must have read the lab manual completely. Failure to comply may result in not being able to complete the lab experiment at the assigned time.

Lab Schedule

	Title	Dates
Lab 1	Benzoic acid extraction	1/7 and 1/12
Lab 2	Freezing point	1/14 and 1/21
Lab 3	Iodine clock	1/26, 1/28, and 2/2
Lab 4	Determination of K_C by spectrometry	2/4 and 2/9
	Lab Exam 1	2/11
Lab 5	K_A of a weak acid	2/11 and 2/18
Lab 6	pK_A of an indicator	2/23 and 2/25
Lab 7	K_{SP} and common ion effect	3/2 and 3/4
Lab 8	Buffer and hydrolysis	3/9 and 3/11
Lab 9	K_{SP} of $Ca(OH)_2$	3/16 and 3/18
	Lab Exam 2	3/23

Lab Report Due Date

Report Number	Due Date
Lab 1 (short report)	1/14
Lab 2 (short report)	1/28
Lab 3 (long report)	2/9
Lab 4 (short report)	2/18
Lab 5 (short report)	2/25
Lab 6 (short report)	3/4
Lab 7 (short report)	3/11
Lab 8 (long report)	3/18
Lab 9 (short report)	3/23

Laboratory Protocol (Failure to comply with any of the following will result in loss of credit for that particular experiment)

1. The pre-lab exercise for each experiment must be completed prior to coming to lab.
2. Only bound notebooks (such as a composition notebook or bound laboratory notebooks) can be used as lab notebooks. Obtain the instructor's approval for the notebook you will be using.
3. All data collected in lab must be entered in the lab notebook using a pen.
4. You must obtain the signature of the lab instructor in the lab notebook at the end of each lab period.
5. You must be present in the lab for the entire duration of the experiment.
6. All lab reports must be typed.