

CHM General Chemistry

Course Name & Code	Course Name	Credit Hours	Lec	Lab	Tut	Prerequisites
CHM 103	General Chemistry	3	3	2	0	Non

Course Description:

This introductory and general chemistry course covers fundamental observations, laws, and theories of chemistry at the basic level. Topics include atoms/molecules, stoichiometry, acids/bases, solutions, equilibrium, gases, solids, liquids, thermodynamics, the periodic table, and chemical bonding.

The chemistry lab is taken in parallel with the course and covers the following basic experiments: density, mass-mass relationship, limiting reactant, acid-base titrations, solubility product, reactions in aqueous solution, calorimetry and redox reactions.

Textbook: CHEMISTRY, T. Brown, H. Lemay Jr., B. Bursten and C. Murphy, Pearson International Edition, 11th Edition, 2009.

Reference : CHEMISTRY, Raymond Chang McGraw-Hill, 9th Edition, 2007.

Topics Outline (Lectures)

Week	Chapter	Topics	Reading Assignments	Suggested Problems	Hours Numbers	Tot
1	Chapter 1	1. Matter and Measurement			1	3
		1.1 The study of chemistry				
		1.2 Classifications of matters				
		1.3 Properties of matters				
		1.4 Units of measurements				
		1.5 Uncertainty in measurements				
2&3	Chapter 2	2. Atoms, Molecules, and Ions	Sect.		2	6
		2.1 The atomic theory				
		2.2 The discovery of atomic structure				
		2.3 Atomic structure				
		2.4 Atomic weight				
		2.5 The periodic table				
		2.6 & 2.7 Molecules and Ionic compounds	Sect.			
		3. Stoichiometry: Calculations with Chemical Formulas			2	6

Week	Chapter	Topics	Reading Assignments	Suggested Problems	Hours Numbers	Tot
4&5	Chapter 3	3.1 Chemical Equations				
		3.2 Chemical reactivity				
		3.3 Formula weight				
		3.4 Avogadro's number and the mole				
		3.5 Empirical formula				
		3.6 Stoichiometry				
		3.7 Limiting reactants	Sect.			
MIDTERM 1 - DURING THE SIXTHTH WEEK						
6, 7 & 8	Chapter 4	4. Aqueous Reactions and Solution Stoichiometry				
		4.1 Aqueous solution				
		4.2 Precipitation reactions				
		4.3 Acid-Base reactions				
		4.4 Oxidation – reduction reactions				
		4.5&6 Solutions; chemical analysis				3
9, 10 & 11	Chapter 16	16. Acid-Base Equilibria				
		16.2 Brønsted-Lowry Acids & Bases				
		16.3 The Autoionization of Water				
		16.4 The pH – Scale				
		16.5 Strength of Acids & Bases				
		16.6 Weak Acids				
		16.7 Weak Bases				3
MIDTERM 2 - DURING THE Twelfth WEEK						
12&13	Chapter 5	5. Thermochemistry				
		5.1 Nature of Energy				
		5.2 First law of thermodynamics				
		5.3 Enthalpy				
		5.4 Enthalpies of reactions				
		5.5 Calorimetry				
		5.6 Hess's law				
		5.7 Enthalpies of formation				2
14 & 15	Chapter 8	8. Basic Concepts of Chemical Bonding				
		8.1 Chemical Bonds, Lewis Symbols, and the Octet Rule				
		8.2 Ionic Bonding				
		8.3 Covalent Bonding				
		8.4 Bond Polarity and Electronegativity				2



Week	Chapter	Topics	Reading Assignments	Suggested Problems	Hours Numbers	Tot
16		Review				3

Topics to be covered (Laboratories)

Lab. No.	Experiments	No. of weeks	Contact hours
Lab01	Basic laboratory techniques	1	2
Lab02	Density of liquids	1	2
Lab03	Density of regular and irregular solids	1	2
Lab04	Stoichiometry: Mass-mass relationship	1	2
Lab05	The chemical composition by mass percentage	1	2
Lab06	Preparation of primary standard and dilution rule & titration	2	4
Lab07	Determination of the empirical formula	1	2
Lab08	Strong acid-strong base titration	1	2
Lab09	Vinegar Analysis, Mass %	1	2
Lab10	Reactions in Aqueous Solutions	1	2
Lab11	Precipitation reaction & Limiting reactant	1	2
Lab12	Redox titration of Fe ²⁺	1	2
Lab13	Determination of the specific heat of metal	1	2

Exams & Grading

Assessment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Proportion of Final Assessment
1	Midterm 1	Around 6 th -7 th week	15 %
2	Midterm 2	Around 11 th -12 th week	15 %
3	Quizzes, Attendance, Participation and Home works	All the semester	10 %
4	Final Exam	Around 15 th -16 th week	40 %
5	Lab experimentations	All the semester	15 %
6	Final Lab Exam	Around 13 th – 14 th week	15 %
Total			100 %

