

CHEM 101 General Chemistry SYLLABUS			
Text Book: Raymond Chang, Chemistry, 10 th edition, 2010, McGraw-Hill			
Topics	Text book pages	No. of Lectures	
Chapter 1: Chemistry: The Study of Change			
1.4 Classifications of matter: substances and mixtures, elements and compounds 1.5 The three states of matter 1.6 Physical and chemical properties of matter: intensive and extensive properties 1.7 Measurement: SI units, mass and weight, volume, density, temperature scales 1.8 Handling numbers: scientific notation, significant figures, accuracy and precision 1.9 Dimensional analysis in solving problems: conversion factors, a note on problem solving	10–30	9	
Review & Exercises			
Chapter 2: Atoms, Molecules and Ions			
2.2 The structure of the atom: the electron, radioactivity, the proton and the nucleus, the neutron 2.3 Atomic number, mass number and isotopes 2.4 The periodic table 2.5 Molecules and ions 2.6 Chemical formulas: molecular formulas, empirical formulas, formula of ionic compound 2.7 Naming compounds: ionic compounds, molecular compounds, acids and bases, familiar inorganic compounds	43–68	7	
Review & Exercises			
FIRST MIDTERM EXAM			
Chapter 3: Mass Relationships in Chemical Reactions			
3.1 Atomic mass: average atomic mass 3.2 Avogadro's number and molar mass of an element 3.3 Molecular mass	80–87	8	
3.5 Percent composition of compounds 3.6 Experimental determination of empirical formulas: determination of molecular formulas 3.7 Chemical reactions and chemical equations: writing chemical equations, balancing chemical equations 3.8 Amounts of reactants and products 3.9 Limiting reagents 3.10 Reaction yield	88–107		
Review & Exercises			
Chapter 4: Reactions in Aqueous Solutions			
4.4 Oxidation-reduction reactions: combination reactions, decomposition reactions, combustion reactions (only)	139–141	1	
4.5 Concentration of solution	147–149		
Review & Exercises			
Chapter 5: Gases			
5.1 Substances that exist as gases 5.2 Pressure of a gas: SI units of pressure, atmospheric pressure 5.3 The gas laws: the pressure-volume relationship: Boyle's law, the temperature-volume relationship: Charles's and Gay-Lussac's law, the volume-amount relationship: Avogadro's law 5.4 The ideal gas equation: density calculation, the molar mass of a gaseous substance 5.5 Gas stoichiometry 5.6 Dalton's law of partial pressures	174–201	5	
Review & Exercises			
SECOND MIDTERM EXAM			

Chapter 6: Thermochemistry		
6.1 The nature of energy and types of energy 6.2 Energy changes in chemical reactions 6.3 Introduction to thermodynamics: the first law of thermodynamics, work and heat 6.4 Enthalpy of chemical reactions: enthalpy, enthalpy of reactions, thermochemical equations, a comparison of ΔH and ΔE 6.5 Calorimetry: specific heat and heat capacity (only)	230–246	5
6.6 Standard enthalpy of formation and reaction: the direct method, the indirect method (Hess's law)	252–258	
Review & Exercises		
Chapter 12: Physical Properties of Solutions		
12.1 Types of solutions 12.2 A molecular view of the solution process 12.3 Concentration units: types of concentration units, comparison of concentration units 12.4 The effect of temperature on solubility: solid solubility and temperature, gas solubility and temperature 12.5 The effect of pressure on the solubility of gases 12.6 Colligative properties of nonelectrolyte solutions: vapor-pressure lowering (Raoult's Law), boiling-point elevation, freezing-point depression, osmotic pressure, using colligative properties to determine molar mass	514–539	7
Review & Exercises		
TOTAL HOURS		42

CHEM 101 LABORATORY	
No.	TITLE
1	Safety rules and laboratory equipment
2	Determination of the hydrogen : oxygen ratio in water
3	Preparation of solutions
4	Determination of concentration and solubility
5	Determination of the molar mass of organic non-ionic compound by the depression of the freezing point of its solutions
6	Determination of the density using different methods
7	Mole ratio and reaction stoichiometry experiment
8	Reactions stoichiometry and percent yield
9	Determination of molar mass by vapor density
10	1 st law of thermodynamic (conservation of energy), work, heat and internal energy (Joule's experiment)
11	Measuring the latent heat of fusion of ice
12	Determination of the Enthalpy (heat) of reaction – Hess's Law

EVALUATION	
1 st midterm exam	15 grades
2 nd midterm exam	15 grades
Laboratory	30 grades
Final exam (all topics)	40 grades
Total	100 grades