

CHEM 101 SYLLABUS

Text book: Raymond Chang, Chemistry, 10th edition, 2010

Topics	Text book pages	Number of Lecture
<i>Matter and Measurements</i>		
1.4 Classifications of Matter: substances and mixtures, elements and compounds. <i>How to right symbols of Elements (the table and the explanation (P 12)</i> 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 - 31	8
<i>Review and Exercises</i>		
<i>Atoms, Molecules and Ions</i>		
2.2 The Structure of the Atoms: the electron, the proton and the neutron. <i>only definitions, masses, and charges</i> <u>[Radioactivity is excluded]</u> 2.3 Atomic Number, Mass Number and Isotopes 2.4 The Periodic Table <i>Periods and groups 1 to 18 - Metals and nonmetals - Alkaline, alkaline earth, halogens, and noble gases.</i> 2.5 Molecules and Ions: molecules, ions. <i>Diatomic molecules and polyatomic molecules - Homonuclear monatomic molecules, homonuclear multiatomic molecules, and heteronuclear molecules (= Covalent compounds) - Ions (monatomic ions and polyatomic ions)</i> 2.7 Naming Compounds: ionic compound, molecular compound, acids and bases, familiar inorganic compound	43 - 54 59 - 68	8
<i>Review and Exercises</i>		
FIRST MIDTERM EXAM		
<i>Stoichiometry and Chemical Equations</i>		
3.1 Atomic Mass: average atomic mass 3.2 Avogadro's Number and the Molar Mass of an Element 3.3 Molecular Mass 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 4.4 Combination reactions, decomposition reactions, combustion reactions. <i>only definition and examples</i> <u>[Oxidation numbers are excluded]</u>	80 - 87 88 - 107 139 - 141	6
<i>Review and Exercises</i>		

<i>Gases</i>		
<p>5.1 Substances That Exist as Gases</p> <p>5.2 Pressure of a Gas: SI units of pressure, atmospheric pressure. <u>[Manometer is excluded]</u></p> <p>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</p> <p>5.4 The Ideal Gas Equation: density calculation, the molar mass of a gaseous substance</p> <p>5.6 Dalton's law of Partial Pressures</p>	<p>174 - 193</p> <p>196 - 200</p>	<p>5</p>
<i>Review and Exercises</i>		
SECOND MIDTERM EXAM		
<i>Thermochemistry</i>		
<p>6.3 Introduction to Thermodynamics: the first law of thermodynamics, work and heat</p> <p>6.4 Enthalpy of Chemical Reactions: enthalpy of reactions, thermochemical equations, a comparison of ΔH and ΔE.</p> <p>6.5 Calorimetry: Only specific heat and heat capacity</p> <p>6.6 Standard Enthalpy of Formation and Reaction: the direct method, the indirect method. <i>The direct method (use of enthalpies of formation to calculate enthalpies of other reaction). The indirect method (Hess's law and its use to calculate enthalpies of other reaction)</i></p> <p>11.8 Phase change: vapor pressure, and molar heat of vaporization and boiling point. <i>Some types of Endothermic and exothermic physical changes and chemical reactions (Enthalpy of fusion, vaporization)</i></p>	<p>233 - 238</p> <p>241 - 246</p> <p>252 - 258</p> <p>490, 491, 496, 497</p>	<p>5</p>
<i>Review and Exercises</i>		
<i>Solutions</i>		
<p>12.1 Types of Solutions <u>[Supersaturated solution is excluded]</u></p> <p>12.2 A Molecular View of the Solution Process</p> <p>4.5 Concentration of solution</p> <p>12.3 Concentration Units: types of concentration units, comparison of concentration units <i>Molarity and dilution of solutions, Percent by mass, mole fraction, molarity</i></p> <p>12.4 The Effect of Temperature on Solubility: solid solubility and temperature, gas solubility and temperature <u>[Fractional crystallization is excluded]</u></p> <p>12.5 The Effect of Pressure on the Solubility of Gases</p> <p>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 <u>[Fractional distillation is excluded]</u></p>	<p>514, 515</p> <p>147 - 150 517 - 521</p> <p>521 - 525</p> <p>527, 528 530 - 538</p>	<p>10</p>
<i>Review and Exercises</i>		
TOTAL HOURS		42

Distribution of the 100 grades over semester:

		Grades
Practical		30
1st midterm	15	30
2nd midterm	15	
Final exam		40
Total		100

FINAL EXAM WILL BE IN ALL TOPICS

الإختبار النهائي سيكون في جميع مواضيع المقرر