CHEM 101 General Chemistry SYLLABUS

Text Book: Raymond Chang, Chemistry, 10th edition, 2010, McGraw-Hill

Topics	Text book pages	Lec. No.
Matter and Measurements		
1.4 Classifications of matter: substances and mixtures, elements and compounds How to right symbols of elements (the table and the explanation (P 12) 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 1.9 Dimensional analysis in solving problems: conversion factors, a note on problem solving	10–22 27–31	4
Review and Exercises		
Atoms, Molecules and Ions		
2.2 The structure of the atoms: the electron, the proton and the neutron (only definitions, masses, and charges) [Radioactivity is excluded] 2.3 Atomic number, mass number and isotopes 2.4 The periodic table Periods and groups 1 to 18 - metals and nonmetals - alkaline, alkaline earth, halogens, and noble gases 2.5 Molecules and ions: molecules, ions Diatomic molecules and polyatomic molecules - homonuclear monatomic molecules, homonuclear multi-atomic molecules, and heteronuclear molecules (covalent compounds) - ions (monatomic ions and polyatomic ions) 2.7 Naming compounds: ionic compound, molecular compound, acids and bases, familiar inorganic compound	43–54 59–68	5
Review and Exercises		
Quantum Theory and the Electronic Structure of Atoms		
7.6 Quantum numbers 7.7 Atomic orbitals 7.8 Electron configuration	294–307	3
Review and Exercises		
Periodic Relationships Among the Elements		
8.2 Periodic classification of the elements 8.3 Periodic variation in physical properties (only atomic radius) 8.4 Ionization energy 8.5 Electron affinity (sections 8.4 and 8.5 can be confined only in properties without more details)	326–332 337–343	3
Review and Exercises		
First Exam		
Stoichiometry and Chemical Equations		
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	80–87 88–107	6
Review and Exercises		

Gases		
5.1 Substances that exist as gases 5.2 Pressure of a gas: SI units of pressure, atmospheric pressure [Manometer is excluded] 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 5.7 The kinetic molecular theory of gases 5.8 Deviation from ideal behavior	174–213	7
Review and Exercises		
Thermochemistry		
6.3 Introduction to thermodynamics: the first law of thermodynamics, work and heat	233–238	5
6.4 Enthalpy of chemical reactions: enthalpy of reactions, thermochemical equations, a comparison of ΔH and ΔE		
6.5 Calorimetry: only specific heat and heat capacity	241–246	
6.6 Standard enthalpy of formation and reaction: the direct method, the indirect method.		
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)	252–258	
Review and Exercises		
Second Exam		
Solutions		
12.1 Types of solutions [Supersaturated solution is excluded] 12.2 A molecular view of the solution process 4.5 Concentration of solution 12.3 Concentration units: types of concentration units, comparison of concentration units Molarity and dilution of solutions, percent by mass, mole fraction, molarity 12.4 The effect of temperature on solubility: solid solubility and temperature, gas solubility and temperature [Fractional crystallization is excluded] 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 [Fractional distillation is excluded]	514–515 147–150 517–521 521–525 527–528 530–538	7
Review and Exercises		
TOTAL HOURS		**42**

Practical

1.8 Handling numbers: scientific notation, significant figures, accuracy and precision p22–27

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

CHEM 101 General Chemistry

First Semester

1441/1442 - 2019/2020

Credit Hours: 4 hours (3+1)

Time: Section 344: Mon 08:00–09:50 am & Wen 09:00–09:50 am
Section 336: Mon 01:00–02:50 pm & Wen 02:00–02:50 pm

Lecture Theater: Section 344: A 1 01 5728 1919
Section 336: B A 916 01 5728

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