

Course Plan of (General Chemistry)

II. Course Description:

The course deals with the study of some basic principles of chemistry (descriptive and theoretical), including matter, classes, physical and chemical properties and measurement, atoms, atomic structure, classes of elements, naming inorganic compounds, electronic structure of atoms molecules, ions, types of formulas, and nomenclature of compounds. It includes periodic properties of the elements, stoichiometry, moles, atomic and molecular weights, chemical reactions, quantitative calculations. Also, it includes a chemical bonding, Lewis structure and molecular geometry.

V. Course Contents:

A. Theoretical Aspect:

Order	Units/Topics List		Sub Topics List	Number of Weeks	Contact Hours
1	Introduction and basic concepts		Introduction and basic concepts: - Matter: atom, element, compound, mixture. - Physical and chemical properties physical and chemical changes, - Intensive and extensive properties, Energy changes. - Units, SI system and Measurements and significant figures: The basic units in SI system.	2	4

2	Atomic Structure		Atomic Structure: - Atoms and their component - Atomic and mass number, Isotopes, Mole, Avogadro's number and the mole and molecular weight. - Periodic table: Historical, modern periodic table - Groups and Periods - Elements of metals, nonmetals, and metalloids and their properties. - Cations and anions - Writing formula from ions - Naming Chemical Compounds: ionic, covalent (molecules), and oxoacid compound (Compound containing mono and polyatomic ions)	3	6
3	Electronic Structure and the Periodic Table		- Introduction to electronic structure - Organization of electrons in atoms - Electronic Structure and the Periodic Table - Orbitals and quantum numbers for electrons: Principal quantum number, the azimuthal quantum number, the magnetic quantum number, and the spin quantum number - The Energies of orbitals - Electron Configuration - Writing electron configuration - Find the position (group & period) of element in Periodic table	1	2
4	Mid-term Exam		-	1	2
5	Periodic Properties of the		- Atomic Size, Ionization Energy, Electron Affinity, Electronegativity, Metallic Characters. Explaining the	2	4

	Elements		Behavior of Elements Through Atomic Properties and Periodic Table: The Halogens as Oxidizing Agents, Acidic, Basic and Amphoteric Properties		
6	Chemical Formulas and Chemical Equations		- Chemical formulas: Empirical, molecular, and structure formulas. - Number mole and mole ratio - Percent composition - Determine the Empirical formula from a percent composition. - Empirical formula and molecular formula - Balance the chemical equation - Chemical Equations Calculations based on Chemical Equations - Yield percent and limiting reacting • Classifying Chemical Reactions ▪ Oxidation-Reduction Reactions, ▪ Combination Reactions ▪ Decomposition Reactions ▪ Displacement Reactions ▪ Metathesis Reactions	2	4
7	Chemical Bonding, Lewis structure and Molecular Geometry		- Lewis Dot Formulas of Atoms - Formation of Ionic bonding metallic and covalent Bonding - Lewis formulas for molecules and polyatomic Ions - The Octet Rule - Resonance - Limitations of the Octet Rule for Lewis Formulas - Polar and Nonpolar Covalent Bonds - Dipole Moments - Formula charge - Molecular Structure and Covalent Bonding Theories - Valence Shell Electron Pair	3	6

			Repulsion (VSEPR) Theory		
8	Introduction to Organic Chemistry		Definition, Nomenclature, Classification, Properties, and Important of Organic compounds.	1	2
9	Final Exam			1	2
Number of Weeks /and Units Per Semester				16	32