CHEMISTRY-SSC-I

Unit-wise Heading, Sub-heading, SLO & Teaching-Method Plan | Based on National Curriculum of Pakistan 2022-23 (NBF Model Textbook)

UNIT NO	CONTENT (HEADING / SUB-HEADING)	SLO #	METHOD (HOW TO TEACH)	RESPONSE	DATE	PRESENT	TEST	PASS /FAIL
Unit 1 NATURE OF SCIENCE IN CHEMISTRY	1.1 What Is Chemistry? (definition and scope) 1.2 Branches of Chemistry 1.2.1 Organic and Inorganic Chemistry 1.2.2 Specialized Branches (physical, analytical, biochemistry, industrial) 1.3 Chemistry and Its Relationship with Other Sciences 1.4 The Scientific Method / Method of Inquiry in Chemistry 1.5 Chemistry, Technology, Society & Environment (STSE) 1.6 Career Prospects in Chemistry	01	Lecture method					
		02	Discussion method					
		03	Compare & contrast method					
		04	Discussion method					
		05	Discussion method					
		06	Demonstration method					
		07	Discussion method					
		08	Storytelling method					
Unit 2 MATTER	2.1 What Is Matter? (definition and properties) 2.2 States of Matter (solid, liquid, gas) 2.3 Kinetic Molecular Theory 2.4 Changes of State (energy involved) 2.4.1 Melting, Freezing, Boiling, Condensation 2.4.2 Sublimation and Deposition 2.5 Physical and Chemical Properties/Changes 2.6 Elements, Compounds and Mixtures 2.7 Plasma and Bose–Einstein Condensate	01	Lecture method					
		02	Lecture with diagram method					
		03	Demonstration with diagram method					
		04	Demonstration method					
		05	Demonstration method					
		06	Demonstration method					
		07	Compare & contrast method					
		08	Discussion method					
		09	Lecture method					
Unit 3 ATOMIC STRUCTURE	3.1 Sub-atomic Particles (proton, neutron, electron) 3.2 Development of Atomic Models 3.2.1 Dalton's, Thomson's and Rutherford's Models 3.2.2 Bohr's Model and Quantum Mechanical Model 3.3 Electronic Configuration 3.3.1 Aufbau Principle, Pauli's Exclusion Principle, Hund's Rule 3.4 Shells, Sub-shells and Orbitals 3.5 Isotopes and Their Uses	01	Lecture method					
		02	Storytelling method					
		03	Compare & contrast method					
		04	Lecture with diagram method					
		05	Demonstration with diagram method					

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		06	Lecture method					
		07	Discussion method					
		08	Case study method					
Unit 4 PERIODIC TABLE AND PERIODICITY OF PROPERTIES	4.1 Development of the Periodic Table 4.2 Modern Periodic Law 4.3 Periods and Groups 4.4 Classification: Metals, Non-metals and Metalloids 4.5 Periodicity of Atomic Radius 4.6 Periodicity of Ionization Energy 4.7 Periodicity of Electronegativity 4.8 Periodicity of Metallic Character	01	Storytelling method					
		02	Lecture method					
		03	Discussion method					
		04	Compare & contrast method					
		05	Demonstration with diagram method					
		06	Lecture with diagram method					
		07	Discussion method					
		08	Compare & contrast method					
Unit 5 CHEMICAL BONDING	5.1 Why Do Atoms Bond? (octet rule)	01	Lecture method					
	5.2 Ionic Bonding	02	Demonstration with diagram method					
	5.3 Covalent Bonding (polar and non-polar)	03	Lecture with diagram method					
	5.4 Coordinate Covalent Bond	04	Discussion method					
	5.5 Metallic Bonding	05	Lecture method					
	5.6 Lewis Structures	06	Hands-on/Practical method					
	5.7 VSEPR Theory and Molecular Shapes	07	Demonstration with diagram method					
	5.8 Intermolecular Forces and Properties of Compounds	08	Compare & contrast method					
Unit 6 STOICHIOMETRY	6.1 Mole Concept and Avogadro's Number	01	Lecture method					
	6.2 Molar Mass and Formula Calculations	02	Problem solving method					
	6.3 Empirical and Molecular Formula	03	Problem solving method					
	6.4 Gas Laws	04	Demonstration method					

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	6.4.1 Boyle's Law	05	Demonstration method					
	6.4.2 Charles's Law	06	Demonstration method					
	6.5 Molarity and Preparation of Solutions	07	Hands-on/Practical method					
	6.6 Limiting Reagent and Percentage Yield	08	Problem solving method					
Unit 7 ELECTROCHEMISTRY	7.1 Oxidation and Reduction (oxidation numbers)	01	Lecture method					
	7.2 Balancing Redox Equations	02	Problem solving method					
	7.3 Electrolytic Cells and Electrolysis	03	Demonstration with diagram method					
	7.4 Galvanic (Voltaic) Cells	04	Demonstration with diagram method					
	7.5 Applications: Electroplating and Extraction of Metals	05	Case study method					
Unit 8 ENERGETICS	8.1 Exothermic and Endothermic Reactions	01	Demonstration method					
	8.2 Enthalpy of Reaction	02	Lecture method					
	8.3 Enthalpy of Formation, Combustion and Neutralization	03	Discussion method					
	8.4 Hess's Law	04	Problem solving method					
	8.5 Activation Energy and Energy Profile Diagrams	05	Lecture with diagram method					
Unit 9 CHEMICAL EQUILIBRIUM	9.1 Reversible Reactions and Dynamic Equilibrium	01	Lecture method					
	9.2 Le Chatelier's Principle	02	Discussion method					
	9.3 Effect of Concentration on Equilibrium	03	Demonstration method					
	9.4 Effect of Pressure and Temperature on Equilibrium	04	Demonstration method					
	9.5 Equilibrium Constant	05	Problem solving method					
	9.6 Industrial Application: The Haber Process	06	Case study method					
Unit 10 ACIDS, BASES AND SALTS	10.1 Properties of Acids and Bases	01	Lecture method					
	10.2 Arrhenius and Bronsted–Lowry Theories	02	Compare & contrast method					
	10.3 pH Scale and Indicators	03	Hands-on/Practical method					

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	10.4 Preparation and Types of Salts	04	Demonstration method					
	10.5 Buffer Solutions	05	Discussion method					
Unit 11 ENVIRONMENTAL CHEMISTRY - AIR	11.1 Composition and Layers of the Atmosphere	01	Lecture with diagram method					
	11.2 Air Pollutants and Their Sources	02	Discussion method					
	11.3 Greenhouse Effect and Global Warming	03	Case study method					
	11.4 Ozone Layer Depletion	04	Discussion method					
	11.5 Acid Rain and Smog	05	Demonstration method					
	11.6 Control Measures for Air Pollution	06	Debate method					
Unit 12 ENVIRONMENTAL CHEMISTRY - WATER	12.1 The Water Cycle	01	Lecture with diagram method					
	12.2 Sources and Causes of Water Pollution	02	Discussion method					
	12.3 Hardness of Water and Softening Methods	03	Hands-on/Practical method					
	12.4 Water Treatment Process	04	Demonstration with diagram method					
	12.5 Waste-Water Treatment	05	Discussion method					
	12.6 Testing Water Quality	06	Hands-on/Practical method					
Unit 13 ORGANIC CHEMISTRY	13.1 Characteristics of Organic Compounds 13.2 Catenation 13.3 Functional Groups 13.4 Homologous Series 13.5 IUPAC Nomenclature 13.6 Isomerism	01	Lecture method					
		02	Discussion method					
		03	Lecture with diagram method					
		04	Discussion method					
		05	Problem solving method					
		06	Compare & contrast method					
Unit 14 HYDROCARBONS	14.1 Alkanes, Alkenes and Alkynes	01	Compare & contrast method					
	14.2 Aromatic Hydrocarbons	02	Lecture method					
	14.3 Sources: Petroleum and Natural Gas	03	Storytelling method					
	14.4 Fractional Distillation of Petroleum	04	Demonstration					

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			with diagram method					
	14.5 Substitution and Addition Reactions	05	Problem solving method					
	14.6 Hydrocarbons as Fuels and Petrochemicals	06	Case study method					
Unit 15 BIOCHEMISTRY	15.1 Carbohydrates 15.2 Proteins 15.3 Lipids 15.4 Nucleic Acids 15.5 Enzymes as Biological Catalysts 15.6 Vitamins and Basic Metabolism	01	Lecture method					
		02	Lecture method					
		03	Discussion method					
		04	Demonstration with diagram method					
		05	Discussion method					
		06	Lecture method					
Unit 16 EMPIRICAL DATA COLLECTION AND ANALYSIS	16.1 Types and Sources of Data	01	Lecture method					
	16.2 Data Collection Methods	02	Hands-on/Practical method					
	16.3 Tabulation and Graphical Representation	03	Activity based method					
	16.4 Accuracy, Precision and Error Analysis	04	Discussion method					
	16.5 Drawing Conclusions from Data	05	Problem solving method					
Unit 17 SEPARATION TECHNIQUES	17.1 Filtration and Evaporation	01	Demonstration method					
	17.2 Simple and Fractional Distillation	02	Demonstration with diagram method					
	17.3 Crystallization	03	Hands-on/Practical method					
	17.4 Sublimation	04	Demonstration method					
	17.5 Centrifugation	05	Lecture method					
	17.6 Selecting the Appropriate Technique	06	Problem solving method					
Unit 18 QUALITATIVE ANALYSIS	18.1 Systematic Scheme for Ion Identification	01	Lecture method					
	18.2 Tests for Common Cations	02	Hands-on/Practical method					
	18.3 Tests for Common Anions	03	Hands-on/Practical method					
	18.4 Flame Tests	04	Demonstration					

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			method					
	18.5 Precipitation and Gas-Evolution Reactions	05	Demonstration method					
Unit 19 CHROMATOGRAPHY	19.1 Principle of Chromatography	01	Lecture method					
	19.2 Paper Chromatography	02	Hands-on/Practical method					
	19.3 Thin-Layer Chromatography (TLC)	03	Demonstration method					
	19.4 Rf Value Calculation	04	Problem solving method					
	19.5 Applications of Chromatography	05	Case study method					