Lesson Plan (Odd Semester) Session 2025-26

Name of the Assistant Professor: Dr. Virender Kumar

Class:- B.Sc Physical Science (Ist Semester) **Subject:-Chemistry**

Period	Topics to be covered	Topic of Assignments
22/07/2025 to 15/08/2025	**Unit-1 Atomic Structure:** Dual behaviour of matter and radiation, de Broglie's relation, Heisenberg's uncertainty principle, concept of atomic orbitals, significance of quantum numbers, radial and angular wave functions, normal and orthogonal wave functions, significance of ψ and ψ^2, shapes of s, p, d and f orbitals, rules for filling electrons in various orbitals, effective nuclear charge, Slater's rules. **Practical; Exp-1.** Titrimetric Analysis: (i) Calibration and use of apparatus (ii) Preparation of solutions of different concentration	
16/08/2025 to 31/08/2025	**Periodic Table and Atomic Properties:** Classification of periodic table, definition of atomic and ionic radii, ionization energy, electron affinity and electronegativity, trends in periodic table (in s and p block elements), Pauling, Mulliken, Allred Rachow and Mulliken Jaffe's electronegativity scale. **Practical; Exp-2.** Standardization of different solution.	
01/09/2025 to 15/09/2025	**Gaseous State:** Kinetic theory of gases, Maxwell's distribution of velocities and energies (derivation excluded), Calculation of root mean square velocity, average velocity and most probable velocity. Collision diameter, collision frequency and mean free path (derivation excluded), Deviation of real gases from ideal gas behaviour, derivation of van der Waal's equation of state, its applications in the calculation of Boyle's temperature (compression factor), Explanation of behaviour of real gases using van der Waal's equation **Practical; Exp-3.** Redox titrations: Determination of Fe^{2+}, $C_2O_4^{2-}$ (using $KMnO_4$ and $K_2Cr_2O_7$)	**Assignments:** Periodic Table and Atomic Properties

16/09/2025 to 30/09/2025	**Solid State:** Classification of solids, Elements of symmetry and symmetry elements of crystals, definition of unit cell and space lattice, bravais lattices, crystal system, Laws of crystallography – Law of constancy of interfacial angles, law of rationality of indices and law of symmetry, Miller Indices X-ray diffraction by crystals, derivation of Bragg's law and Bragg's equation, Determination of crystal structure of NaCl and KCl. **Practical; Exp-4.** To determine the surface tension of a given liquid by drop number method using stalagmometer.	
01/10/2025 to 15/10/2025	**General Organic Chemistry:** Localized and Delocalized chemical bond, van der Waal's interactions, resonance and its conditions and applications, hyperconjugation, inductive effect, electromeric effect and their comparison. **Practical; Exp-5.** To prepare m-dinitrobenzene from nitrobenzene using nitrating mixture	
16/10/2025 to 22/11/2025	**Stereochemistry of Organic Compounds:** Types of isomerism, optical isomerism - elements of symmetry, molecular chirality, chiral and achiral molecules with two stereogenic centres, enantiomers and their properties, diastereomers and their properties, erythro and threo diastereomers, meso compounds, Difference between conformations and configurations, Newmann and Sawhorse projections, Fischer and Flying wedge configurations Conformational isomerism – conformational analysis of ethane and n-butane, conformations of cyclohexane, Relative and absolute configurations, sequence rules, R & S systems of nomenclature, Geometric isomerism – cis, trans isomerism, E & Z system of nomenclature **Practical; Exp-6.** To prepare Iodoform from acetone/ ethyl alcohol Revision as per demand of students	

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