



राजकीय स्नातकोत्तर महाविद्यालय, महेन्द्रगढ़

GOVERNMENT POST-GRADUATE COLLEGE, MAHENDERGARH

Accredited by NAAC with "B" grade and Affiliated to I.G. University, Meerpur (Rewari)

LESSON PLAN ODD SEMESTER

(FOR THE SESSION 2024-2025)

Name of the Extension Lecturer	Dr. Manju Kumari
Class	B.Sc. 1 st Semester
Subject	Chemistry

Week	Topics
22.07.2024 - 27.07.2024	Atomic Structure Idea of de Broglie matter waves, Heisenberg uncertainty principle, atomic orbitals, quantum numbers, radial and angular wave functions and probability distribution curves, shapes of s, p, d orbitals.
29.07.2024 - 03.08.2024	General principles of periodic table: Aufbau and Pauli exclusion principles, Hund's multiplicity rule. Electronic configurations of the elements, effective nuclear charge, Slater's rules.
05.08.2024 - 10.08.2024	Atomic and ionic radii, ionization energy, electron affinity and electronegativity –definition, methods of determination or evaluation,
12.08.2024 - 17.08.2024	Gaseous States Maxwell's distribution of velocities and energies (derivation excluded) Calculation of root mean square velocity, average velocity and most probable velocity. Collision diameter, collision number, collision frequency and mean free path. Deviation of Real gases from ideal behaviour.
19.08.2024 - 24.08.2024	Derivation of Vander Waal's Equation of State, its application in the calculation of Boyle's temperature (compression factor) Explanation of behaviour of real gases using Vander Waal's equation.
26.08.2024 - 31.08.2024	Critical Phenomenon: Critical temperature, Critical pressure, critical volume and their determination. PV isotherms of real gases, continuity of states, the isotherms of Vander Waal's equation, relationship between critical constants and Vander
02.09.2024 - 07.09.2024	Waal's constants. Critical compressibility factor. The Law of corresponding states. Lequifaction of gases
09.09.2024 - 14.09.2024	Structure and Bonding Localized and delocalized chemical bond, van der Waals in

	teractions, resonance: conditions, resonance effect and its applications, hyperconjugation, inductive effect, Electromeric effect & their comparison.
16.09.2024 - 21.09.2024	Mechanism of Organic Reactions Curved arrow notation, drawing electron movements with arrows, half-headed and double-headed arrows, homolytic and heterolytic bond breaking. Types of reagents – electrophiles and nucleophiles.
23.09.2024 - 28.09.2024	Mechanism of Organic Reactions Curved arrow notation, drawing electron movements with arrows, half-headed and double-headed arrows, homolytic and heterolytic bond breaking. Types of reagents – electrophiles and nucleophiles.
30.09.2024 - 05.10.2024	Types of organic reactions. Energy considerations. Reactive intermediates carbocations, carbanions, free radicals, carbenes, arynes and nitrenes (formation, structure & stability). Assigning formal charges on intermediates and other ionic species.
07.10.2024 - 12.10.2024	Liquid States Structure of liquids. Properties of liquids – surface tension, viscosity vapour pressure and optical rotations and their determination.
14.10.2024 - 19.10.2024	Solid State Classification of solids, Laws of crystallography – (i) Law of constancy of interfacial angles (ii) Law of rationality of indices (iii) Law of symmetry. Symmetry elements of crystals. Definition of unit cell & space lattice. Bravais lattices
21.10.2024 - 26.10.2024	crystal system. X-ray diffraction by crystals. Derivation of Bragg equation. Determination of crystal
28.10.2024 - 02.11.2024	Diwali Vacations
04.11.2024 - 09.11.2024	structure of NaCl, KCl. Liquid crystals: Difference between solids, liquids and liquid crystals, types of liquid crystals. Applications of liquid crystals.
11.11.2024 - 16.11.2024	structure of NaCl, KCl. Liquid crystals: Difference between solids, liquids and liquid crystals, types of liquid crystals. Applications of liquid crystals.
18.11.2024 - 23.11.2024	Revision and Class Test

Dr. Manju Kumari
Extension Lecturer
Department of Chemistry
Government College, Mahendergarh



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LESSON PLAN ODD SEMESTER

(FOR THE SESSION 2024-2025)

Name of the Extension Lecturer	Dr. Manju Kumari
Class	B.Sc. 3 rd Semester
Subject	Inorganic Chemistry

Week	Topics
22.07.2024 - 27.07.2024	Definition of transition elements, position in the periodic table, General characteristics & properties of 1st transition elements,
29.07.2024 - 03.08.2024	Definition of transition elements, position in the periodic table, General characteristics & properties of 1st transition elements,
05.08.2024 - 10.08.2024	Structures & properties of some compounds of transition elements – TiO_2 , VOCl_2 , FeCl_3 , CuCl_2 and $\text{Ni}(\text{CO})_4$
12.08.2024 - 17.08.2024	Structures & properties of some compounds of transition elements – TiO_2 , VOCl_2 , FeCl_3 , CuCl_2 and $\text{Ni}(\text{CO})_4$
19.08.2024 - 24.08.2024	Chemistry of Elements of IInd & IIIrd transition series General characteristics and properties of the IInd and IIIrd transition elements
26.08.2024 - 31.08.2024	Comparison of properties of 3d elements with 4d & 5d elements with reference only to ionic radii, oxidation state,
02.09.2024 - 07.09.2024	magnetic and Spectral properties and stereochemistry
09.09.2024 - 14.09.2024	Coordination Compounds Werner's coordination theory
16.09.2024 - 21.09.2024	effective atomic number concept, chelates
23.09.2024 - 28.09.2024	nomenclature of coordination compounds
30.09.2024 - 05.10.2024	isomerism in coordination compounds,
07.10.2024 - 12.10.2024	valence bond theory of transition metal complexes
14.10.2024 - 19.10.2024	Non-aqueous Solvents Physical properties of a solvent,

21.10.2024 - 26.10.2024	types of solvents and their general characteristics,
28.10.2024 - 02.11.2024	Diwali Vacations
04.11.2024 - 09.11.2024	reactions in non-aqueous solvents with reference to liquid NH_3 and liquid SO_2
11.11.2024 - 16.11.2024	reactions in non-aqueous solvents with reference to liquid NH_3 and liquid SO_2
18.11.2024 - 23.11.2024	Revision and Class Test

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Name of the Extension Lecturer	Dr. Manju Kumari
Class	B.Sc. 3 rd Semester
Subject	Organic Chemistry

Week	Topics
22.07.2024 - 27.07.2024	Alcohols Monohydric alcohols nomenclature, methods of formation by reduction of aldehydes, ketones, carboxylic acids and esters. Hydrogen bonding.
29.07.2024 - 03.08.2024	Acidic nature. Reactions of alcohols. Dihydric alcohols — nomenclature, methods of formation,
05.08.2024 - 10.08.2024	chemical reactions of vicinal glycols, oxidative cleavage $[\text{Pb}(\text{OAc})_4$ and HIO_4] and pinacol-pinacolone rearrangement.
12.08.2024 - 17.08.2024	Epoxides Synthesis of epoxides. Acid and base-catalyzed ring opening of epoxides, orientation of epoxide ring opening, reactions of Grignard and organolithium reagents with epoxides
19.08.2024 - 24.08.2024	Phenols Nomenclature, structure and bonding. Preparation of phenols, physical properties and acidic character.
26.08.2024 - 31.08.2024	Comparative acidic strengths of alcohols and phenols, resonance stabilization of phenoxide ion. Reactions of phenols — electrophilic aromatic substitution,
02.09.2024 - 07.09.2024	Mechanisms of Fries rearrangement, Claisen rearrangement, Reimer-Tiemann reaction, Kolbe's reaction and Schotten and Baumann reactions.
09.09.2024 - 14.09.2024	Ultraviolet (UV) absorption spectroscopy Absorption laws (Beer-Lambert law), molar absorptivity, presentation and analysis of UV spectra, types of electronic transitions,

16.09.2024 - 21.09.2024	effect of conjugation. Concept of chromophore and auxochrome.
23.09.2024 - 28.09.2024	Bathochromic, hypsochromic, hyperchromic and hypochromic shifts.
30.09.2024 - 05.10.2024	UV spectra of conjugated enes and enones
07.10.2024 - 12.10.2024	Woodward- Fieser rules, calculation of λ_{max} of simple conjugated dienes and -unsaturated ketones.
14.10.2024 - 19.10.2024	Applications of UV Spectroscopy in structure elucidation of simple organic compounds.
21.10.2024 - 26.10.2024	Carboxylic Acids & Acid Derivatives Nomenclature of Carboxylic acids, structure and bonding, physical properties, acidity of carboxylic acids, effects of substituents on acid strength.
28.10.2024 - 02.11.2024	Diwali Vacations
04.11.2024 - 09.11.2024	Preparation of carboxylic acids. Reactions of carboxylic acids. Hell-Volhard-Zelinsky reaction. Reduction of carboxylic acids. Mechanism of decarboxylation. Structure, nomenclature and preparation of acid chlorides, esters, amides and acid anhydrides.
11.11.2024 - 16.11.2024	Relative stability of acyl derivatives. Physical properties, interconversion of acid derivatives by nucleophilic acyl substitution. Mechanisms of esterification and hydrolysis (acidic and basic).
18.11.2024 - 23.11.2024	Revision and Class Test

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