GOVT. COLLEGE BARWALA HISAR

Lesson Plan (2025-26)

Name of Teaching Faculty: Mr. Vikash Chander

Subject: Chemistry Class : BSc 3rd Year 5th Semester, 5 days per week(2-6) Section:

Week	Date From	Date Upto	Topics
Week 1	28/07/2025	02/08/2025	Bronsted–Lowry concept, conjugate acids and bases, relative strengths of acids and bases, effects of substituent and solvent, differentiating and levelling solvents. Lewis acid-base concept, classification of Lewis acids and bases, Lux-Flood concept and solvent system concept.
Week 2	04/08/2025	09/08/2025	Hard and soft acids and bases (HSAB concept), applications of HSAB process. Periodicity in s- and p-block elements with respect to electronic configuration, atomic and ionic size, ionization enthalpy, electron gain enthalpy, electronegativity (Pauling scale). General characteristics of s-block metals like density, melting and boiling points, flame colour and reducing nature.
Week 3	11/08/2025	16/08/2025	Oxidation states of s- and p-block elements, inert-pair effect, diagonal relationships and anomalous behaviour of first member of each group. Allotropy in C, P and S.
Week 4	18/08/2025	23/08/2025	Complex forming tendency of s block elements and a preliminary idea of crown ethers and cryptates, structures of basic beryllium acetate, salicylaldehyde/ acetylacetonato complexes of Group 1 metals. Solutions of alkali metals in liquid ammonia and their properties. Common features, such as ease of formation, solubility and stability of oxides, peroxides, superoxides, sulphates and carbonates of s-block metals.
Week 5	25/08/2025	30/08/2025	Diborane and concept of multicentre bonding, hydrides of Groups 13 (EH3), 14, 15
Week 6	01/09/2025	06/09/2025	hydrides of Groups 16 and 17. Oxides of N and P, Oxoacids of P, S and Cl.
Week 7	08/09/2025	13/09/2025	Noble gases: Rationalization of inertness of noble gases, clathrates, preparation and properties of XeF2, XeF4 and XeF6 ,bonding in these compounds using VBT and shapes of noble gas compounds using VSEPR Theory
Week 8	15/09/2025	20/09/2025	Types of inorganic polymers and comparison with organic polymers, structural features, classification and important applications of silicates.
Week 9	22/09/2025	27/09/2025	Synthesis, structural features and applications of silicones.Borazines and cyclophosphazenes preparation, properties and reactions. Bonding in (NPCl2)3.
Week 10	29/09/2025	04/10/2025	Review of energy sources (renewable and non renewable). Classification of fuels and their calorific value. Coal:Uses of coal (fuel and nonfuel) in various industries, its composition, carbonization of coal. Coal gas, producer gas and water gas—composition and uses.
Week 11	06/10/2025	11/10/2025	Fractionation of coal tar, uses of coal tar bases chemicals, requisites of a good metallurgical coke, Coal gasification (Hydro gasification and Catalytic gasification), Coal liquefaction and Solvent Refining.
Week 12	13/10/2025	18/10/2025	Composition of crude petroleum, Refining and different types of petroleum products and their applications. Fractional Distillation (Principle and process), Cracking (Thermal and catalytic cracking), Reforming Petroleum and non-petroleum fuels (LPG, CNG, LNG, bio-gas, fuels derived from biomass), fuel from waste, synthetic fuels (gaseous and liquids), clean fuels.
Week 13	20/10/2025	25/10/2025	Diwali Vacation
Week 14	27/10/2025	01/11/2025	Petrochemicals: Vinyl acetate, Propylene oxide, Isoprene, Butadiene, Toluene and its derivatives Xylene. Classification of lubricants, lubricating oils (conducting and nonconducting) Solid and semisolid lubricants, synthetic lubricants. Properties of lubricants (viscosity index, cloud point, pore point) and their determination.
Week 15	03/11/2025	08/11/2025	Chief modes of occurrence of metals based on standard electrode potentials, Ellingham diagrams. Hydrometallurgy with reference to cyanide process for gold and silver. Methods of purification of metals (Al, Pb, Ti, Fe, Cu, Ni, Zn, Au)
Week 16	10/11/2025	15/11/2025	electrolytic refining, zone refining, van Arkel-de Boer process, Parting Process, Mond's process and Kroll Process. Halides and oxohalides of P and S (PCl3, PCl5, SOCl2 and SO2Cl2)
Week 17	17/11/2025	22/11/2025	Interhalogen compounds. A brief idea of pseudohalides
Week 18	24/11/2025	29/11/2025	Revision & Problem Solving

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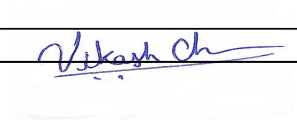
Lesson Plan (2025-26)

Name of Teaching Faculty: Mr. Vikash Chander

Subject: Chemistry of Oils and Dyes Class : UG 1st Year 1st Semester, 2 days per week(1-2) Section:

Week	Date From	Date Upto	Topics
Week 1	28/07/2025	02/08/2025	Introduction to oils and fats
Week 2	04/08/2025	09/08/2025	classification, common fatty acids present in oils and fats
Week 3	11/08/2025	16/08/2025	difference between fats and oils, Saponification value,
Week 4	18/08/2025	23/08/2025	iodine value, acid value
Week 5	25/08/2025	30/08/2025	Applications and uses of different oils and fats
Week 6	01/09/2025	06/09/2025	Definition; Colour and constitution
Week 7	08/09/2025	13/09/2025	Classification on the basis of origin
Week 8	15/09/2025	20/09/2025	application methods
Week 9	22/09/2025	27/09/2025	applications and uses of the Methyl orange (azo dye);
Week 10	29/09/2025	04/10/2025	applications and uses of the Malachite green (tiphenylmethane dye)
Week 11	06/10/2025	11/10/2025	Mid Term Exam
Week 12	13/10/2025	18/10/2025	applications and uses of the Phenolphthalein (Phthalein dye)
Week 13	20/10/2025	25/10/2025	Diwali Vacation
Week 14	27/10/2025	01/11/2025	applications and uses of the Alizarin (anthraquinone dye)
Week 15	03/11/2025	08/11/2025	Revision & Problem Solving
Week 16	10/11/2025	15/11/2025	applications and uses of the Alizarin (anthraquinone dye)
Week 17	17/11/2025	22/11/2025	applications and uses of the Alizarin (anthraquinone dye)
Week 18	24/11/2025	29/11/2025	Revision & Problem Solving
Week 19	01/12/2025	06/12/2025	Revision & Problem Solving
Week 20	08/12/2025	13/12/2025	Revision & Problem Solving



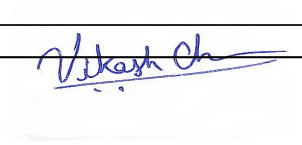
GOVT. COLLEGE BARWALA HISAR

Lesson Plan (2025-26)

Name of Teaching Faculty: Mr. Vikash Chander

Subject: Basic Laboratory Techniques Class : BSc 1st Year 1st Semester, 2 days per week(5-6) Section:

Week	Date From	Date Upto	Topics
Week 1	28/07/2025	02/08/2025	Chemical labeling and Chemical concepts related to solution preparation
Week 2	04/08/2025	09/08/2025	Equivalent mass, molar mass, specific gravity
Week 3	11/08/2025	16/08/2025	concentration (Normality, Molarity, Molality)
Week 4	18/08/2025	23/08/2025	concentration (%w/v, %w/w, %v/v, ppm solutions)
Week 5	25/08/2025	30/08/2025	Standardization of solutions using Volumetric Titrations, Primary and Secondary standards.
Week 6	01/09/2025	06/09/2025	Indicators
Week 7	08/09/2025	13/09/2025	preparation of indicator solutions: (Phenolphthalein, Starch Solution, Eriochrome Black T, N-Phenylanthranilic acid)
Week 8	15/09/2025	20/09/2025	Buffer Solutions, Types of Buffer Solutions
Week 9	22/09/2025	27/09/2025	Henderson Hasselbalch Equation, Preparation and determination of pH of buffer solutions
Week 10	29/09/2025	04/10/2025	Revision & Problem Solving
Week 11	06/10/2025	11/10/2025	Mid Term Exam
Week 12	13/10/2025	18/10/2025	Purification of compounds through distillation
Week 13	20/10/2025	25/10/2025	Diwali Vacation
Week 14	27/10/2025	01/11/2025	Purification of compounds through crystallization
Week 15	03/11/2025	08/11/2025	Purification of compounds through sublimation
Week 16	10/11/2025	15/11/2025	Revision & Problem Solving
Week 17	17/11/2025	22/11/2025	Complexometric Titrations using EDTA.
Week 18	24/11/2025	29/11/2025	Revision & Problem Solving
Week 19	01/12/2025	06/12/2025	Revision & Problem Solving
Week 20	08/12/2025	13/12/2025	Revision & Problem Solving



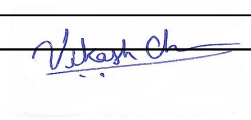
GOVT. COLLEGE BARWALA HISAR

Lesson Plan (2025-26)

Name of Teaching Faculty: Mr. Vikash Chander

Subject: Energy Resources and Water Treatment Class : UG 2nd Year 3rd Semester, 2 days per week(1-2) Section:

Week	Date From	Date Upto	Topics
Week 1	28/07/2025	02/08/2025	Energy Resources: Renewable
Week 2	04/08/2025	09/08/2025	Energy Resources: Non-Renewable
Week 3	11/08/2025	16/08/2025	Energy Storage: Cell
Week 4	18/08/2025	23/08/2025	Concept of Batteries
Week 5	25/08/2025	30/08/2025	Fuel Cell
Week 6	01/09/2025	06/09/2025	Solar Cell
Week 7	08/09/2025	13/09/2025	Sources of Drinking Water and Uses
Week 8	15/09/2025	20/09/2025	Water Conservation
Week 9	22/09/2025	27/09/2025	Permissible TDS
Week 10	29/09/2025	04/10/2025	Water Pollution
Week 11	06/10/2025	11/10/2025	Mid Term Exam
Week 12	13/10/2025	18/10/2025	Tehniques of Purification of Water
Week 13	20/10/2025	25/10/2025	Diwali Vacation
Week 14	27/10/2025	01/11/2025	Osmosis and Reverse Osmosis
Week 15	03/11/2025	08/11/2025	Wastewater Management
Week 16	10/11/2025	15/11/2025	Revision & Problem Solving
Week 17	17/11/2025	22/11/2025	Revision & Problem Solving
Week 18	24/11/2025	29/11/2025	Revision & Problem Solving



GOVT. COLLEGE BARWALA HISAR

Lesson Plan (2025-26)

Name of Teaching Faculty: Mr. Vikash Chander

Subject: Chemistry-III Class : BSc 2nd Year 3rd Semester, 2 days per week(1-2) Section:

Week	Date From	Date Upto	Topics
Week 1	28/07/2025	02/08/2025	General group trends with special reference to electronic configuration, variable valency, colour, magnetic and catalytic properties
Week 2	04/08/2025	09/08/2025	ability to form complexes, stability of various oxidation states (Latimer diagrams) for Fe and Cu.
Week 3	11/08/2025	16/08/2025	Electronic configurations, oxidation states, colour, magnetic properties, lanthanide contraction, separation of lanthanides (ion exchange method only).
Week 4	18/08/2025	23/08/2025	Alkyl Halides Preparation: from Alkenes and Alcohols, Types of Nucleophilic Substitution reactions(SN1,SN2,SNi)
Week 5	25/08/2025	30/08/2025	Reactions of Alkyl Halides: Nitrite and Nitro formation, Nitrile and Isonitrile formation, Williamson's Ether synthesis.
Week 6	01/09/2025	06/09/2025	Aryl Halide Preparation(Chloro, Bromo and Iodo). Chemical reactions(Chlorobenzene) Aomatic Nucleophilic substitution(by OH group) effect of Nitro substituent.
Week 7	08/09/2025	13/09/2025	Benzyne Mechanism: KNH2/NH3 OR NaNH2/NH3. Reactivity and relative strength of C-X bond in alkyl, allyl, vinyl and aryl halides.
Week 8	15/09/2025	20/09/2025	Alcohols: Preparation: Preparation of 1o , 2o and 3o alcohols: using Grignard reagent, Ester hydrolysis, Reduction of aldehydes, ketones, carboxylic acid and esters.
Week 9	22/09/2025	27/09/2025	Reactions: With sodium, HX (Lucas test), esterification, oxidation (with PCC, acidic dichromate)
Week 10	29/09/2025	04/10/2025	Phenols Preparation: From cumrnr, diazonium salts and grignard's reagent. Acidic Nature, Chemical Reactions: Electrophilic substitution: nitration, halogenation.
Week 11	06/10/2025	11/10/2025	Mid Term Exam
Week 12	13/10/2025	18/10/2025	Reimer-Tiemann Reaction, Claisen rearrangement, Fries rarrangement and Schotten-Baumann Reaction, Kolbe's reaction(with mechanism).
Week 13	20/10/2025	25/10/2025	Diwali Vacation
Week 14	27/10/2025	01/11/2025	Introduction, Equivalent and Molar Conductiviy and their variation with dilution for weak and strong electrolytes,
Week 15	03/11/2025	08/11/2025	Kohlrausch's Law of independent migration of ions. Transport Number, Ionic Mobility
Week 16	10/11/2025	15/11/2025	Applications of conductance measurements: determination of degree of ionization of weak electrolyte, solubility and solubility products of sparingly soluble salts, ionic product of water
Week 17	17/11/2025	22/11/2025	Conductometric titrations (only acid base).Concept of pH and pKa, buffer solution, buffer action, Handerson Hazel Blac equation.
Week 18	24/11/2025	29/11/2025	Revision & Problem Solving

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