Govt. College for Women, Gharaunda

Lesson Plan

Jan 2025 to April 2025 (Even Semester)

B.Sc. Chemistry 2nd Semester

Mr. Sukh Raj & Mrs. Rachna
Subject : Chemistry

Week 1	08/02/2025 to 15/02/2025
	Covalent Bond Valence bond theory approach, shapes of simple inorganic molecules and ions based on valence shell electron pair repulsion (VSEPR) theory
Week 2	17/02/2025 to 22/02/2025
	hybridization withsuitable examples of linear, trigonal planar, square planar, tetrahedral, trigonal bipyramidal and octahedral arrangements.
Week 3	24/02/2025 to 01/03/2025
	Molecular orbital theory of homonuclear(N_2, O_2) and heteronuclear (CO and NO) diatomic molecules, dipole moment and percentage ionic character in covalent bond.
Week 4	03/03/2025 to 08/03/2025
	Chemical Kinetics Concept of reaction rates, rate equation, factors influencing the rate of reaction,
Week 5	17/03/2025 to 22/03/2025
	Order and molecularity of a reaction, integrated rate expression for zero, first, second order reactions (for equal conc. of reactants), Half-life period of a reaction.
Week 6	24/03/2025 to 29/03/2025
	Alkanes (upto 5 carbon atoms) Alkanes, nomenclature, classification of carbon atoms in alkanes. Isomerism in alkanes, sources,

Week 7	31/03/2025 to 05/04/2025
	methods of formation: Wurtz reaction, Kolbe reaction, Corey-House reaction and decarboxylation of carboxylic acids.
Week 8	07/04/2025 to 12/04/2025
	physical properties. Mechanism of free radical halogenation of alkanes: reactivity and selectivity.
Week 9	15/04/2025 to 19/04/2025
	Metallic Bond and semiconductors Metallic bond – Qualitative idea of valence bond and Band theories of metallic bond
Week 10	21/04/2025 to 26/04/2025
	(conductors, semiconductors, insulators). Semiconductors – Introduction, types, and applications.
Week 11-15	28/04/2025 to 31/05/2025
	Test & revision

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Lesson Plan

Jan 2025 to April 2025 (Even Semester)

B.Sc. Chemistry 4th Semester

Mr. Sukh Raj & Mrs. Rachna

Subject : Chemistry

Week 1	08/02/2025 to 15/02/2025
	Chemistry of d-Block elements : Definition of transition elements, General characteristic properties of d-Block elements, Comparison of ionic radii 3d, 4d and 5d series elements, magnetic properties, Stability of various oxidation states
Week 2	17/02/2025 to 22/02/2025
	Latimer and Frost diagrams, Structure of some compounds of transition elements- TiO_2, $VOCl_2$, $FeCl_3$, $CuCl_2$ and $Ni(CO)_4$ Chemistry of f-Block elements Lanthanide contraction, oxidation states,
Week 3	24/02/2025 to 01/03/2025
	magnetic properties, complex formation, colour and ionic radii. Actinides: General characteristics of actinides, Transuranic elements, comparison of properties of Lanthanides and actinides with transition elements.
Week 4	03/03/2025 to 08/03/2025
	Theory of Qualitative and Quantitative Analysis Chemistry of analysis of various groups of basic and acidic radicals, chemistry of identification of acid radicals in typical combination
Week 5	17/03/2025 to 22/03/2025
	Common ion effect, solubility product, theory of precipitation, co-precipitation, post precipitation, purification of precipitates..
Week 6	24/03/2025 to 29/03/2025
	Thermodynamics-I First law of thermodynamics: statement, concepts of internal energy and enthalpy. Heat capacity, heat capacities at constant volume and pressure and their relationship.

Week 7	31/03/2025 to 05/04/2025

Joule– Thomson coefficient for ideal gas and real gas and inversion temperature. Calculation of w, q, dU & dH for the expansion of ideal gases under isothermal and adiabatic conditions for reversible process.

Week 8	07/04/2025 to 12/04/2025

Second law of thermodynamics, Carnot cycles and its efficiency, Concept of entropy, entropy as a function of V & T, entropy as a function of P & T.
Chemical Equilibrium Concept of Equilibrium constant, Temperature dependence of equilibrium constant, Clausius–Clapeyron equation and its applications.

Week 9	15/04/2025 to 19/04/2025

Alcohols: Monohyric alcohols: nomenclature, methods of formation by reduction of aldehydes, ketones, carboxylic acids, and esters. Hydrogen bonding, Acidic nature. Reactions of alcohols.

Week 10	21/04/2025 to 26/04/2025

Phenols Nomenclature, structure, and bonding. Preparation: Cumene hydroperoxide method, from diazonium salts, physical properties, and acidic character.

Week 11	28/04/2025 to 03/05/2025

Chemical Reactions: — electrophilic aromatic substitution. Mechanisms of Fries rearrangement, Claisen rearrangement, Reimer-Tiemann reaction, Kolbe's reaction.

Week 12	05/05/2025 to 10/05/2025

Aldehydes and Ketones Nomenclature and structure of the carbonyl group. Preparation: oxidation of alcohols, from acid chlorides and from nitriles, Comparison of reactivities of aldehydes and ketones.

Govt. College for Women, Gharaunda

Lesson Plan

Jan 2025 to April 2025 (Even Semester)

B.Sc. Chemistry 6th Semester

Mr. Sukh Raj & Mrs. Rachna

Subject : Chemistry

Week 1	01/01/2025 to 04/01/2025
	Introduction: Molecular orbital picture and aromatic characteristics of pyrrole, furan, thiophene and pyridine
Week 2	07/01/2025 to 11/01/2025
	Methods of synthesis and chemical reactions with particular emphasis on the mechanism of electrophilic substitution. Mechanism of nucleophilic substitution reactions in pyridine derivatives.
Week 3	13/01/2025 to 18/01/2025
	Comparison of basicity of pyridine, piperidine and pyrrole. Introduction to condensed five and six- membered heterocycles
Week 4	20/01/2025 to 25/01/2025
	Prepration and reactions of indole, quinoline and isoquinoline. Mechanism of electrophilic substitution reactions of, quinoline and isoquinoline.
Week 5	27/01/2025 to 01/02/2025
	Acidity of α-hydrogens, alkylation of diethyl malonate and ethyl acetoacetate. Synthesis of ethyl acetoacetate: the Claisen condensation. Keto-enol tautomerism of ethyl acetoacetate
Week 6	03/02/2025 to 08/02/2025
	Addition or chain-growth polymerization. Free radical vinyl polymerization, ionic vinyl polymerization, Ziegler -Natta

Week 13	12/05/2025 to 31/05/2025

Mechanism of nucleophilic additions to carbonyl group: benzoin, aldol, Perkin and Knoevenagel condensations. Condensation with ammonia and its derivatives. Wittig reaction. Mannich reaction, Baeyer–Villiger oxidation of ketones. Cannizzaro reaction, MPV, Clemmensen and WolffKishner reductions.

Test and Revision

polymerization and vinyl polymers.

Week 7	10/02/2025 to 15/02/2025
	Condensation or step growth polymer ization. Polyesters, polyamides, phenol formaldehyde resins. Natural and synthetic rubbers.
Week 8	17/02/2025 to 22/02/2025
	Ideal and non-ideal solutions, methods of expressing concentrations of solutions. Dilute solutions, Raoult's law.
Week 9	24/02/2025 to 01/03/2025
	Colligative properties: (i) relative lowering of vapour pressure (ii) Elevation in boiling point (iii) depression in freezing point (iv) osmotic pressure
Week 10	03/03/2025 to 08/03/2025
	Thermodynamic derivation of relation between amount of solute and elevation in boiling point and depression in freezing point.. Applications in calculating molar masses of normal, dissociated and associated solutes in solution.
Week 11	17/03/2025 to 22/03/2025
	Statement and meaning of the terms – phase, component and degree of freedom, thermodynamic derivation of Gibbs phase rule, phase equilibria of one component system –Example – water system.

Principal
GCW (Bastara) Gharaunda

27/2/2025

Week 12	24/03/2025 to 29/03/2025
	Phase equilibria of two component systems solid-liquid equilibria, simple eutectic Example Pb-Ag system, desilverisation of lead
Week 13	31/03/2025 to 05/04/2025
	Classification, of amino acids. Acid-base behavior, isoelectric point and electrophoresis. Preparation of α-amino acids.
Week 14	07/04/2025 to 12/04/2025
	Structure and nomenclature of peptide s and proteins. Classification of proteins. Peptide structure determination, end group analysis,
Week 15	15/04/2025 to 19/04/2025
	selective hydrolysis of peptides Classical peptide synthesis, solid–phase peptide synthesis. Structures of peptides and proteins : Primary & Secondary structure
Week 16	21/04/2025 to Onwards
	Tests and Revision