

Govt. College for Women, Gharaunda

Lesson Plan

Jan 2024 to April 2024 (Even Semester)

Mr. Sukh Raj & Mrs. Rachna  
Subject : Chemistry

B.Sc. Chemistry 2nd Semester

Week 1	15/02/2024 to 17/02/2024
<b>Covalent Bond</b> Valence bond theory approach, shapes of simple inorganic molecules and ions based on valence shell electron pair repulsion (VSEPR) theory	
Week 2	19/02/2024 to 23/02/2024
hybridization with suitable examples of linear, trigonal planar, square planar, tetrahedral, trigonal bipyramidal and octahedral arrangements.	
Week 3	26/02/2024 to 02/03/2024
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	04/03/2024 to 09/03/2024
<b>Chemical Kinetics</b> Concept of reaction rates, rate equation, factors influencing the rate of reaction,	
Week 5	11/03/2024 to 16/03/2024
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	18/03/2024 to 22/03/2024
<b>Alkanes (upto 5 carbon atoms)</b> Alkanes, nomenclature, classification of carbon atoms in alkanes. Isomerism in alkanes, sources.	

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Week 7	01/04/2024 to 06/04/2024
methods of formation: Wurtz reaction, Kolbe reaction, Corey-House reaction and decarboxylation of carboxylic acids,	
Week 8	08/04/2024 to 13/04/2024
physical properties. Mechanism of free radical halogenation of alkanes: reactivity and selectivity.	
Week 9	15/04/2024 to 20/04/2024
<b>Metallic Bond and semiconductors</b> Metallic bond – Qualitative idea of valence bond and Band theories of metallic bond	
Week 10	22/04/2024 to 30/04/2024
(conductors, semiconductors, insulators). Semiconductors – Introduction, types, and applications.	

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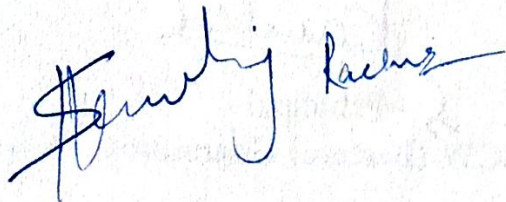
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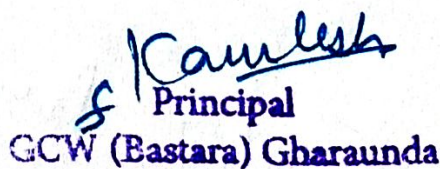
Jan 2024 to April 2024 (Even Semester)

Mr. Sukh Raj & Mrs. Rachna  
Subject : Chemistry

B.Sc. Chemistry 4th Semester

Week 1	02/01/2024 to 06/01/2024
	Structure and nomenclature of amines, physical properties Separation of a mixture of primary, secondary and tertiary amines
Week 2	08/01/2024 to 13/01/2024
	Structural features affecting basicity of amines Preparation of alkyl and aryl amines (reduction of nitro compounds, nitriles, reductive amination of aldehydic and ketonic compounds)
Week 3	15/01/2024 to 20/01/2024
	Gabriel -phthalimide reaction, Hofmann bromamide reaction. Electrophilic aromatic substitution in aryl amines, reactions of amines with nitrous acid.
Week 4	22/01/2024 to 27/01/2024
	Mechanism of diazotisation, structure of benzene diazonium chloride, Replacement of diazo group by H, OH, F, Cl, Br, I, NO <sub>2</sub> and CN groups reduction of diazonium salts to hydrazines, coupling reaction and its synthetic application.
Week 5	29/01/2024 to 03/02/2024
	Nomenclature and structure of the carbonyl group. Synthesis of aldehydes and ketones with particular reference to the synthesis of aldehydes from acid chlorides,
Week 6	05/02/2024 to 10/02/2024
	advantage of oxidation of alcohols with chromium trioxide (Sarett reagent)



  
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	pyridinium chlorochromate (PCC) and pyridinium dichromate. Physical properties, Comparison of reactivities of aldehydes and ketones.
<b>Week 7</b>	12/02/2024 to 17/02/2024
	Mechanism of nucleophilic additions to carbonyl group with particular emphasis on benzoin, aldol, Perkin and Knoevenagel condensations
<b>Week 8</b>	19/02/2024 to 24/02/2024
	Condensation with ammonia and its derivatives. Wittig reaction. Mannich reaction. Oxidation of aldehydes, Baeyer-Villiger oxidation of ketones, Cannizzaro reaction. MPV, Clemmensen, Wolff-Kishner, $\text{LiAlH}_4$ and $\text{NaBH}_4$ reductions
<b>Week 9</b>	26/02/2024 to 02/03/2024
	Molecular vibrations, Hooke's law, selection rules, intensity and position of IR bands, measurement of IR spectrum
<b>Week 10</b>	04/03/2024 to 09/03/2024
	fingerprint region, characteristic absorptions of various functional groups and interpretation of IR spectra of simple organic compounds. Applications of IR spectroscopy in structure elucidation of simple organic compounds
<b>Week 11</b>	11/03/2024 to 16/03/2024
	Electrolytic and Galvanic cells – reversible & irreversible cells, conventional representation of electrochemical cells.
<b>Week 12</b>	18/03/2024 to 22/03/2024
	Calculation of thermodynamic quantities of cell reaction ( $\Delta G$ , $\Delta H$ & $K$ ). Types of reversible electrodes – metal-metal ion, gas electrode
<b>Week 13</b>	01/04/2024 to 06/04/2024
	metal-insoluble salt-anion and redox electrodes. Electrode reactions, Nernst equations, derivation of cell EMF and single electrode potential

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Week 14	08/04/2024 to 12/04/2024
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Standard Hydrogen electrode, reference electrodes, standard electrode potential, sign conventions  
Concentration cell

Week 15	15/04/2024 to 20/04/2024
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Applications of EMF measurement in solubility product and potentiometric titrations using glass electrode  
numerical problems

Week 16	22/04/2024 to 30/04/2024
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Tests and Revision

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Lesson Plan

Jan 2024 to April 2024 (Even Semester)

B.Sc. Chemistry 6th Semester

Mr. Sukh Raj & Mrs. Rachna

Subject : Chemistry

Week 1	02/01/2024 to 06/01/2024
	Introduction: Molecular orbital picture and aromatic characteristics of pyrrole, furan, thiophene and pyridine
Week 2	08/01/2024 to 13/01/2024
	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	15/01/2024 to 20/01/2024
	Comparison of basicity of pyridine, piperidine and pyrrole. Introduction to condensed five and six- membered heterocycles
Week 4	22/01/2024 to 27/01/2024
	Preparation and reactions of indole, quinoline and isoquinoline. Mechanism of electrophilic substitution reactions of, quinoline and isoquinoline.
Week 5	29/01/2024 to 03/02/2024
	Acidity of $\alpha$ -hydrogens, alkylation of diethyl malonate and ethyl acetoacetate. Synthesis of ethyl acetoacetate: the Claisen condensation. Keto-enol tautomerism of ethyl acetoacetate
Week 6	05/02/2024 to 10/02/2024
	Addition or chain-growth polymerization. Free radical vinyl polymerization, ionic vinyl polymerization, Ziegler -Natta

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polymerization and vinyl polymers.	
Week 7	12/02/2024 to 17/02/2024
Condensation or step growth polymerization. Polyesters, polyamides, phenol formaldehyde resins. Natural and synthetic rubbers.	
Week 8	19/02/2024 to 24/02/2024
Ideal and non-ideal solutions, methods of expressing concentrations of solutions, Dilute solutions, Raoult's law.	
Week 9	26/02/2024 to 02/03/2024
Colligative properties: (i) relative lowering of vapour pressure (ii) Elevation in boiling point (iii) depression in freezing point (iv) osmotic pressure	
Week 10	04/03/2024 to 09/03/2024
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	11/03/2024 to 16/03/2024
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.	

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Week 12	18/03/2024 to 22/03/2024
Phase equilibria of two component systems solid-liquid equilibria, simple eutectic Example Pb-Ag system, desilverisation of lead	
Week 13	01/04/2024 to 06/04/2024
Classification, of amino acids. Acid-base behavior, isoelectric point and electrophoresis. Preparation of $\alpha$ -amino acids.	

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Week 14	08/04/2024 to 12/04/2024
	Structure and nomenclature of peptides and proteins. Classification of proteins. Peptide structure determination, end group analysis,
Week 15	15/04/2024 to 20/04/2024
	selective hydrolysis of peptides Classical peptide synthesis, solid-phase peptide synthesis. Structures of peptides and proteins : Primary & Secondary structure
Week 16	22/04/2024 to 30/04/2024
	Tests and Revision

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