

Govt. College for Women, Gharaunda
Lesson Plan
April 2022 to July 2022 (Even Semester)

B.Sc. Chemistry 2nd Semester

Mr. Sukh Raj & Mrs. Rachna

Subject : Chemistry

Week 1	11/04/2022 to 16/04/2022
	Introduction to alkenes, Nomenclature of alkenes Mechanisms of dehydration of alcohols and dehydrohalogenation of alkyl halide The Saytzeff rule, Hofmann elimination
Week 2	18/04/2022 to 23/04/2022
	Physical properties and relative stabilities of alkenes Chemical reactions of alkenes, mechanisms involved in hydrogenation, electrophilic and free radical additions
Week 3	25/04/2022 to 30/04/2022
	Markownikoff's rule, hydroboration-oxidation, oxymercuration-oxymmercuration reduction, ozonolysis hydration, hydroxylation and oxidation with KMnO_4 .
Week 4	02/05/2022 to 07/05/2022
	Nomenclature and classification of dienes: isolated, conjugated and cumulated dienes. Structure of butadiene Chemical reactions-1,2 and 1,4 additions (Electrophilic & free radical mechanism), Diels-Alder reaction
Week 5	09/05/2022 to 14/05/2022
	Nomenclature, structure and bonding in alkynes. Methods of formation. Chemical reactions of alkynes acidity of alkynes. Mechanism of electrophilic and nucleophilic addition reactions, hydroboration-oxidation of alkynes
Week 6	16/05/2022 to 21/05/2022
	Nomenclature of benzene derivatives : Aromatic nucleus and side chain, Aromaticity: the Huckel rule, aromatic ions, annulenes up to 10 carbon atoms, aromatic, anti-aromatic and non-aromatic compounds
Week 7	23/05/2022 to 28/05/2022
	Aromatic electrophilic substitution -general pattern of the mechanism, mechanism of nitration, halogenation, sulphonation and Friedel-Crafts reaction
Week 8	30/05/2022 to 04/06/2022

Energy profile diagrams. Activating ,deactivating substituents and orientation.
Nomenclature and classes of alkyl halides, methods of formation

Week 9	06/06/2022 to 11/06/2022
	chemical reactions. Mechanisms and stereochemistry of nucleophilic substitution reactions of alkyl halides, SN2 and SN1 reactions with energy profile diagrams
Week 10	13/06/2022 to 18/06/2022
	Methods of formation and reactions of aryl halides, The addition elimination and the elimination-addition mechanisms of nucleophilic aromatic substitution reactions.
Week 11	20/06/2022 to 25/06/2022
	Relative reactivities of alkyl halides v s allyl, vinyl and aryl halides.
Week 12	27/06/2022 to 02/07/2022
	Electrolytic conduction, factors affecting electrolytic conduction, specific conductance, molar conductance, equivalent conductance and relation among them and their variation with concentration. Arrhenius theory of ionization, Ostwald's Dilution Law. Debye-Huckel – Onsager's equation for strong electrolytes (elementary treatment only), Application of Kohlrausch's Law in calculation of conductance of weak electrolytes at infinite dilution.
Week 13	04/07/2022 to 10/07/2022
	Applications of conductivity measurements: determination of degree of dissociation, determination of K_a of acids determination of solubility product of sparingly soluble salts, conductometric titrations Concepts of pH and pKa , Buffer solution, Buffer action, Henderson – Hazel equation, Buffer mechanism of buffer action

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Lesson Plan

April 2022 to July 2022 (Even Semester)

B.Sc. Chemistry 4th Semester

Mr. Sukh Raj & Mrs. Rachna

Subject : Chemistry

Week 1	11/04/2022 to 16/04/2022
	Structure and nomenclature of amines, physical properties Separation of a mixture of primary, secondary and tertiary amines
Week 2	18/04/2022 to 23/04/2022
	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	25/04/2022 to 30/04/2022
	Gabriel -phthalimide reaction, Hofmann bromamide reaction. Electrophilic aromatic substitution in aryl amines, reactions of amines with nitrous acid.
Week 4	02/05/2022 to 07/05/2022
	Mechanism of diazotisation, structure of benzene diazonium chloride, Replacement of diazo group by H, OH, F, Cl, Br, I, NO ₂ and CN groups reduction of diazonium salts to hydrazines, coupling reaction and its synthetic application.
Week 5	09/05/2022 to 14/05/2022
	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	16/05/2022 to 21/05/2022
	advantage of oxidation of alcohols with chromium trioxide (Sarett reagent)

	pyridinium chlorochromate (PCC) and pyridinium dichromate. Physical properties, Comparison of reactivities of aldehydes and ketones.
Week 7	23/05/2022 to 28/05/2022
	Mechanism of nucleophilic additions to carbonyl group with particular emphasis on benzoin, aldol, Perkin and Knoevenagel condensations
Week 8	30/05/2022 to 04/06/2022
	Condensation with ammonia and its derivatives. Wittig reaction. Mannich reaction. Oxidation of aldehydes, Baeyer–Villiger oxidation of ketones, Cannizzaro reaction. MPV, Clemmensen, Wolff-Kishner, LiAlH ₄ and NaBH ₄ reductions
Week 9	06/06/2022 to 11/06/2022
	Molecular vibrations, Hooke's law, selection rules, intensity and position of IR bands, measurement of IR spectrum
Week 10	13/06/2022 to 18/06/2022
	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
Week 11	20/06/2022 to 25/06/2022
	Electrolytic and Galvanic cells – reversible & irreversible cells, conventional representation of electrochemical cells.
Week 12	27/06/2022 to 02/07/2022
	Calculation of thermodynamic quantities of cell reaction (ΔG , ΔH & K). Types of reversible electrodes – metal-metal ion, gas electrode, metal-insoluble salt-anion and redox electrodes. Electrode reactions, Nernst equations, derivation of cell EMF and single electrode potential
Week 13	04/07/2022 to 09/07/2022
	Standard Hydrogen electrode, reference electrodes, standard electrode potential, sign conventions Concentration cell Applications of EMF measurement in solubility product and potentiometric titrations using glass electrode numerical problems

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Lesson Plan

April 2022 to July 2022 (Even Semester)

B.Sc. Chemistry 6th Semester

Mr. Sukh Raj & Mrs. Rachna

Subject : Chemistry

Week 1	11/04/2022 to 16/04/2022
	Introduction: Molecular orbital picture and aromatic characteristics of pyrrole, furan, thiophene and pyridine
Week 2	18/04/2022 to 23/04/2022
	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	25/04/2022 to 30/04/2022
	Comparison of basicity of pyridine, piperidine and pyrrole. Introduction to condensed five and six- membered heterocycles
Week 4	02/05/2022 to 07/05/2022
	Preparation and reactions of indole, quinoline and isoquinoline. Mechanism of electrophilic substitution reactions of, quinoline and isoquinoline.
Week 5	09/05/2022 to 14/05/2022
	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	16/05/2022 to 21/05/2022
	Addition or chain-growth polymerization. Free radical vinyl polymerization, ionic vinyl polymerization, Ziegler -Natta

	polymerization and vinyl polymers.
Week 7	23/05/2022 to 28/05/2022
	Condensation or step growth polymerization. Polyesters, polyamides, phenol formaldehyde resins. Natural and synthetic rubbers.
Week 8	30/05/2022 to 04/06/2022
	Ideal and non-ideal solutions, methods of expressing concentrations of solutions, Dilute solutions, Raoult's law. Colligative properties: (i) relative lowering of vapour pressure (ii) Elevation in boiling point (iii) depression in freezing point (iv) osmotic pressure
Week 9	06/06/2022 to 11/06/2022
	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. 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.
Week 10	13/06/2022 to 15/06/2022
	Phase equilibria of two component systems solid-liquid equilibria, simple eutectic Example Pb-Ag system, desilverisation of lead Classification, of amino acids. Acid-base behavior, isoelectric point and electrophoresis. Preparation of α -amino acids. Structure and nomenclature of peptides and proteins. Classification of proteins. Peptide structure determination, end group analysis, selective hydrolysis of peptides Classical peptide synthesis, solid-phase peptide synthesis. Structures of peptides and proteins : Primary & Secondary structure.