**LESSON PLAN (EVEN SEMESTER 2023-24 )**

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**GOVERNMENT COLLEGE MOHNA**

**B.Sc. 1st Year (Inorganic Chemistry)**

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| **Month/Week** | **First week**  | **Second week** | **Third week** | **Fourth week** |
| **January** | Hydrogen Bonding ,Brief discussion of various types of Vander Waals Forces | Metallic Bond- Brief introduction to meta llic bond, band theory of meta llic bond | Semiconductors- Introduction, types and applications. | Comparative study of the elements including , diagonal relationships, salient features of hydrides solvation and complexation |
| **February** | Chemical properties of the noble gases with emphasis on their low chemical reactivity,  | chemistry of xenon, structure and bonding of fluorides, ox ides & oxyfluorides of xenon | Diborane – properties and structure (as an example of electron – deficient compound and multicentre bonding), | Borazene – chemical properties and structure Trihalides of Boron – Trends in fewis acid character structure of aluminium (III) chloride. |
| **March** | Catenation, p π– d π bonding (an idea), carbides, fluorocarbons, silicates structural aspects), | silicons – general methods of preparations, properties and uses. | Oxides – structures of oxides of N,P. oxyacids – structure and relative acid strengths of oxyacids of Nitrogen and phosphorus. Structure of white, yellow and red phosphorus. | **-** |
| **April** | Oxyacids of sulphur – structures and acidic strength H2O2 –structure, properties and uses | Basic prope r ties of halogen, interha logens,hydro and oxyacids of chlorine –  | Revision | Revision |

**B.Sc. 1st Year (Organic Chemistry)**

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| **Month/Week** | **First week**  | **Second week** | **Third week** | **Fourth week** |
| **January** | Nomenclatu re of alkenes, , mechanisms of dehydration of alcohols and dehydrohalogenation of alkyl halides,. The Saytzeff rule, Hofmann elimination | , physical properties and relative stabilities of alkenes.Chemical reactions of alkenes | Nomenclatu re of benzene deriva tives:. Aromatic nucleus and side chain. Aromaticity: the Huckel rule, aromatic ions, annulenes up to 10 carbon atoms, aromatic, | Anti - aromatic and non – aromatic compounds. Aromatic electrophilic substitution |
| **February** | mechansim of nitration, halogenation, sulphonation, and Friedel-Crafts reaction. Energy profile diagrams. Activating , deactivating subs tituents and orientation. | Nomenclature and classification of dienes: isolated, conjugated and cumulated dienes. Structure of butadiene,. Chemical reactions | Diels-Alder reaction, 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 S |
| **March** | Nomenclatu re and classes of alkyl halides, methods of formation, chemical reactions. | stereochemistry of nucleophilic substitution reactions of alkyl halides | SN2 and SN1reactions with energy profile diagrams | **-** |
| **April** | .Methods of formation and reactions of aryl halides, The additionelimination and the elimination-addition mechanisms of nucleophilic aromatic substitution reactions. | Relative reactivities of alkyl halides vs allyl, vinyl and aryl halides. | Revision | Revision |

**B.Sc. III Year (Inorganic Chemistry)**

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| **Month/Week** | **First week**  | **Second week** | **Third week** | **Fourth week** |
| **January** | Definition, nomenclature and classification of organometallic compounds. | Preparation, properties, and bonding of alkyls of Li, and Al,  | Preparation, properties, and bonding of alkyls of, Hg, and Sn | metal-ethylenic complexes |
| **February** | Mononuclear carbonyls and the nature of bonding in metal carbonyls. | Arrhenius, Bronsted – Lowry, the Lux – Flood, | Solvent system and Lewis concepts of acids & bases | Relative strength of acids & bases, Concept of Hard and Soft Acids & Bases. |
| **March** | Symbiosis, electronegativity and hardness and softness | Essential and trace elements in biological processes, metalloporphyrins with special reference to haemoglobin and myoglobin | Biological role of alkali and alkaline earth metal ions with special reference to Ca2+. Nitrogen fixation. | **-** |
| **April** | Silicones -their preparation, properties,structure and uses | Phosphazenes- their preparation, properties,structure and uses | Revision | Revision |

**B.Sc. III Year (Organic Chemistry)**

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| **Month/Week** | **First week**  | **Second week** | **Third week** | **Fourth week** |
| **January** | Introduction: Molecular orbital p icture and aromatic characteristics of pyrrole, furan, thiophene and pyridine | Methods of synthesis and chemical reactions with particular emphasis on the mechanism of electrophilic substitution. Mechanism of nucleophilic substitution reactions in pyridine derivatives. | Comparison of basicity of pyridine, piperidine and pyrrole , Introduction to condensed five and six- membered heterocycles | Prepration and reactions of indole, quinoline and isoquinoline |
| **February** | Skraup synthesis and Bischler-Napieralski synthesis. Mechanism of electrophilic substitution reactions of, quinoline and isoquinoline | Nomenclature, structural features, Methods of formation and chemical reactions of thiols, thioethers, sulphonic acids, sulphonamides and sulphaguanidine.  | Synthetic detergents alkyl and aryl sulphonates.v Acidity of -hydrogens, alkylation of diethyl malonate and ethyl acetoacetate.  | Synthesis of ethyl acetoacetate: the Claisen condensation. Keto-enol tautomerism of ethyl acetoacetate |
| **March** | Addition or chain-growth polymerization. Free radical vinyl polymerization, ionic vinyl polymerization,  | Ziegler-Natta polymerization and vinyl polymers. Condensat ion or step growth polymerization. Polyeste rs ,polyamides,  | phenol formaldehyde resins, urea formaldehyde resins, epoxy re sins and polyurethanes. Natural and synthetic rubbers | **-** |
| **April** | Acid-base behavior, isoelectric point and electrophoresis. Preparation of -amino acids.Structure and nomenclature of peptides and proteins | Peptide structure determination, end group analysis, selective hydrolysis of peptides. Classical peptide synthesis, solid– phase peptide synthesis. Structures of proteins | Revision | Revision |

**B.Sc. II Year (Inorganic Chemistry)**

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| **Month/Week** | **First week**  | **Second week** | **Third week** | **Fourth week** |
| **March** | Chemistry of analysis of various acidic radicals,  | Chemistry of identification of acid radicals in typical combinations, | Chemistry of interference of acid radicals including their removal in the analys is of basic radicals. | Chemistry of analysis of various groups of basic radicals |
| **April** | Theory of precipitation, co- precipitation, Post- precipitation, | purification of precipitates | Revision | Revision |