|  |  |  |
| --- | --- | --- |
| Date | Topics to be Covered  | Teaching Method  |
| 25-07-24To11-08-24 | **101TH** Review of Bohr’s theory and its limitations, dual behaviour of matter and radiation, de Broglie’s relation, HeisenbergUncertainty principle. Hydrogen atom spectra. Need of a new approach to Atomic structure. Schrodinger waveequation and meaning of various terms in it. Significance of ψ and ψ2. Radial and angular nodes and theirsignificance. Radial distribution functions and the concept of the most probable distance with special reference to 1sand 2s atomic orbitals.**101PR**Inorganic Chemistry - Volumetric Analysis Estimation of sodium carbonate and sodium hydrogen carbonate present in a mixture. Estimation of oxalic acid by titrating it with KMnO4. | * Lecture based instruction
* Inquiry based learning
* Laboratory Experiments
* Flipped Classroom
* Interactive simulations
* Problem based learning
* Blended learning
 |
| 13-08-24To26-08-24 | **101TH**Significance of quantum numbers, Shapes of s, p and d atomic orbitals, nodal planes. Rulesfor filling electrons in various orbitals, Electronic configurations of the atoms. Stability of half-filled and completelyfilled orbitals, concept of exchange energy. Relative energies of atomic orbitals, Anomalous electronicconfigurations. Slater rules and applications.**101PR**Estimation of water of crystallization in Mohr’s salt by titrating with KMnO4. Estimation of Fe (II) ions by titrating it with K2Cr2O7 using internal indicator.  Estimation of Cu (II) ions iodometrically using Na2S2O3. | * Lecture based instruction
* Inquiry based learning
* Laboratory Experiments
* Flipped Classroom
* Interactive simulations
* Problem based learning
* Blended learning
 |
| 28-08-24To16-09-24 | Ionic Bonding: General characteristics of ionic bonding. Energy considerations in ionic bonding, lattice energy andsolvation energy and their importance in the context of stability and solubility of ionic compounds. Statement ofBorn-Landé equation for calculation of lattice energy, Born-Haber cycle and its applications, polarizing power and polarizability. Fajan’s rules, ionic character in covalent compounds, bond moment, dipole moment and percentage ionic character. | * Lecture based instruction
* Inquiry based learning
* Laboratory Experiments
* Flipped Classroom
* Interactive simulations
* Problem based learning
* Blended learning
 |
| 18-09-24To30-09-24 | **101TH** Covalent bonding- VB Approach: Shapes of some inorganic molecules and ions on the basis of VSEPR andhybridization with suitable examples of linear, trigonal planar, square planar, tetrahedral, trigonal bipyramidal and octahedral arrangements. Concept of resonance and resonating structures in various inorganic and organiccompounds. MO Approach: Rules for the LCAO method, bonding and antibonding MOs and their characteristics fors-s, s-p and p-p combinations of atomic orbitals, nonbonding combination of orbitals, MO treatment of homonuclear diatomic molecules up to Ne (including idea of s-p mixing) and heteronuclear diatomic molecules such as CO, NO and NO+. Comparison of VB and MO approaches.**101PR**Purification of organic compounds by crystallization (from water and alcohol) and distillation. | * Lecture based instruction
* Inquiry based learning
* Laboratory Experiments
* Flipped Classroom
* Interactive simulations
* Problem based learning
* Blended learning
 |
| 3-10-24To14-10-24 | **101TH** Fundamentals of Organic ChemistryPhysical Effects, Electronic Displacements: Inductive Effect, Electromeric Effect, Resonance and Hyperconjugation. Cleavage of Bonds: Homolysis and Heterolysis. Structure, shape and reactivity of organic molecules: Nucleophiles and electrophiles. Reactive Intermediates: Carbocations, Carbanions and free radicals.**101PR**Separation of mixtures by Chromatography: Measure of Rf value of a mixture of two  organic compounds. | * Lecture based instruction
* Inquiry based learning
* Laboratory Experiments
* Flipped Classroom
* Interactive simulations
* Problem based learning
* Blended learning
 |
| 16-10-24To28-10-24 | Stereochemistry Conformations with respect to ethane, butane and cyclohexane. Interconversion of Wedge Formula, Newman, Sawhorse and Fischer projections. Concept of chirality (upto two carbon atoms). Configuration: Geometrical and Optical isomerism; Enantiomerism, Diastereomerism and Meso compounds). Threo and erythro; D and L; cis – trans nomenclature; CIP Rules: R/ S (for upto 2 chiral carbon atoms) and E / Z Nomenclature (for upto two C=C systems). | * Lecture based instruction
* Inquiry based learning
* Laboratory Experiments
* Flipped Classroom
* Interactive simulations
* Problem based learning
* Blended learning
 |
| 30-10-24To9-11-24 | Aliphatic HydrocarbonsFunctional group approach for the following reactions (preparations & reactions) to be studied in context to theirstructure.Alkanes: (Upto 5 Carbons). Preparation: Catalytic hydrogenation, Wurtz reaction, Kolbe’s synthesis, from Grignardreagent. Reactions: Free radical Substitution: Halogenation.Alkenes: (Upto 5 Carbons) Preparation: Elimination reactions: Dehydration of alkenes and dehydrohalogenation ofalkyl halides (Saytzeff’s rule); cis alkenes (Partial catalytic hydrogenation) and trans alkenes (Birch reduction).Reactions: cis-addition (alk. KMnO4) and trans-addition (bromine), Addition of HX (Markownikoff’s and antiMarkownikoff’s addition), Hydration, Ozonolysis, oxymecuration-demercuration, Hydroboration-oxidation. | * Lecture based instruction
* Inquiry based learning
* Laboratory Experiments
* Flipped Classroom
* Interactive simulations
* Problem based learning
* Blended learning
 |
| 15-11-24 Onwards  | Revision for MMTMMT Tentative | Class Test, Student Presentation, Problem Solving |
| 15-12-24To31-12-24 | Alkynes: (Upto 5 Carbons) Preparation: Acetylene from CaC2 and conversion into higher alkynes; by dehalogenation of tetra halides and dehydrohalogenation of vicinal-dihalides. Reactions: Formation of metal acetylides, addition of bromine and alkaline KMnO4, ozonolysis and oxidation with hot alkaline KMnO4. | * Lecture based instruction
* Inquiry based learning
* Laboratory Experiments
* Flipped Classroom
* Interactive simulations
* Problem based learning
* Blended learning
 |
| 4-02-24 To17-02-24 | Revision: Atomic Structure & Chemical Bonding | Class Test, Student Presentation, Problem Solving |
| 18-02-24To29-02-24 | Revision: Fundamentals of Organic ChemistryStereochemistryAlkanes, Alkenes, Alkynes and Benzene | Class Test, Student Presentation, Problem Solving |
| March 2024 | Final Practicals |  |