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| Date | Topics to be Covered | Teaching Method |
| 25-07-24  To  11-08-24 | **301TH**  **Polynuclear Hydrocarbons:** Synthesis & reactions of Naphthalene, Anthracene & Phenanthrene. Relative reactivity of these compounds at various positions. **Synthetic dyes:** Colour and constitution [electronic concept], classification of dyes. Chemistry and synthesis of methyl orange, congo red, malachite green, crystal violet, phenolphthalein, fluorescein, alizarin and indigo. **301PR**  Preparation of any two of the following complexes and measurement of their conductivity: (i) tetraamminecarbonatocobalt (III) nitrate (ii) tetraamminecopper (II) sulphate (iii) potassium trioxalatoferrate (III) trihydrate | * Lecture based instruction * Inquiry based learning * Laboratory Experiments * Flipped Classroom * Interactive simulations * Problem based learning * Blended learning |
| 13-08-24  To  26-08-24 | **301TH**  Heterocyclic compounds: Introduction: Classification and nomenclature, Molecular orbital picture & aromatic characteristics of pyrrole, furan, thiophene & pyridine. Methods of synthesis, chemical reactions with emphasis on mechanism of electrophilic substitution. Mechanism of nucleophilic substitution reactions in pyridine. comparison of basicity of pyridine, piperidine and pyrrole. **301PR**  Colorimetry Draw calibration curve (absorbance at λmax vs. concentration) for various concentrations of a given coloured compound (KMnO4/ CuSO4) and estimate the concentration of the same in a given solution. | * Lecture based instruction * Inquiry based learning * Laboratory Experiments * Flipped Classroom * Interactive simulations * Problem based learning * Blended learning |
| 28-08-24  To  16-09-24 | Ionic Bonding: General characteristics of ionic bonding. Energy considerations in ionic bonding, lattice energy and  solvation energy and their importance in the context of stability and solubility of ionic compounds. Statement of  Born-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 |
| 18-09-24  To  30-09-24 | **301TH**  Introduction to condensed five & six-membered heterocyclic compounds, preparation & reactions of indole quinoline & isoquinoline with special reference to Fisher indole synthesis Skraup synthesis & Bischler – Napieralski synthesis. Mechanism of electrophilic substitution reactions of indole, quinoline, & isoquinoline .  **301PR**  Colorimetry Draw calibration curve (absorbance at λmax vs. concentration) for various concentrations of a given coloured compound (KMnO4/ CuSO4) and estimate the concentration of the same in a given solution. | * Lecture based instruction * Inquiry based learning * Laboratory Experiments * Flipped Classroom * Interactive simulations * Problem based learning * Blended learning |
| 3-10-24  To  14-10-24 | **301TH**  Application of UV and IR Spectroscopy to Simple Organic Molecules Application of visible, ultraviolet and Infrared spectroscopy in organic molecules. Electromagnetic radiations, electronic transitions, λmax. & Ԑmax. chromophore, auxochrome, bathochromic and hypsochromic shifts. Application of electronic spectroscopy and Woodward rules for calculating λmax. of conjugated dienes and α, β – unsaturated compounds.  **301PR**  Separation of mixtures by chromatography: Measure the Rf value in each case. (Combination of two ions to be given) Paper chromatographic separation of Fe3+, A13+ and Cr3+ or Paper chromatographic separation of Ni2+, Co2+ , Mn2+ and Zn2+ | * Lecture based instruction * Inquiry based learning * Laboratory Experiments * Flipped Classroom * Interactive simulations * Problem based learning * Blended learning |
| 16-10-24  To  28-10-24 | Infrared radiation and types of molecular vibrations, functional group and fingerprint region. IR spectra of alkanes, alkenes and simple alcohols (inter and intramolecular hydrogen bonding), aldehydes, ketones, carboxylic acids and their derivatives (effect of substitution on >C=O stretching absorptions). | * Lecture based instruction * Inquiry based learning * Laboratory Experiments * Flipped Classroom * Interactive simulations * Problem based learning * Blended learning |
| 30-10-24  To  9-11-24 | Nuclear Magnetic Resonance Spectroscopy: Principle of nuclear magnetic resonance, number of signals, peak areas equivalent & non-equivalent protons, positions of signals, chemical shift. Shielding & deshielding of protons, proton counting.splitting of signals & coupling constants, magnetic equivalence of protons. Discussion of PMR spectra of molecules : ethyl bromide, n – propyl bromide, isopropyl bromide 1,1-dibromoethane 1,1,2- tribromo ethane, ethanol, toluene, acetaldehyde, acetophenone. Simple problems on PMR spectroscopy for structure determination of organic compounds. | * Lecture based instruction * Inquiry based learning * Laboratory Experiments * Flipped Classroom * Interactive simulations * Problem based learning * Blended learning |
| 15-11-24 Onwards | Revision for MMT  MMT Tentative | Class Test, Student Presentation, Problem Solving |
| 15-12-24  To  31-12-24 | Nuclear Magnetic Resonance Spectroscopy: Principle of nuclear magnetic resonance, number of signals, peak areas equivalent & non-equivalent protons, positions of signals, chemical shift. Shielding & deshielding of protons, proton counting.splitting of signals & coupling constants, magnetic equivalence of protons. Discussion of PMR spectra of molecules : ethyl bromide, n – propyl bromide, isopropyl bromide 1,1-dibromoethane 1,1,2- tribromo ethane, ethanol, toluene, acetaldehyde, acetophenone. Simple problems on PMR spectroscopy for structure determination of organic compounds. | * Lecture based instruction * Inquiry based learning * Laboratory Experiments * Flipped Classroom * Interactive simulations * Problem based learning * Blended learning |
| 4-02-24  To  17-02-24 | Revision and hands on experience for practicals  Class Test | Class Test, Student Presentation, Problem Solving |
| 18-02-24  To  29-02-24 | Revision and class test on each section based on HPU exam pattern | Class Test, Student Presentation, Problem Solving |
| March 2024 | Final Practicals |  |