CURRICULUM PLAN - Dr. Meenakshi Verma

(Even Semester (online), 2020-2021)

B.Sc. (H) Chemistry, III Year (Semester VI)

Name of Paper:-Organic Chemistry V: Spectroscopy (CBCS)

Contents	Allocation of Lectures	Month wise schedule to be followed	Tutorial/Assignments /Presentation etc
Organic Spectroscopy: General principles Introduction to absorption and emission spectroscopy. *UV Spectroscopy*: Types of electronic transitions, λ_{max}, Chromophores and Auxochromes, Bathochromic and Hypsochromic shifts, Intensity of absorption; Application of Woodward Rules for calculation of λ_{max} for the following systems: α,β-unsaturated aldehydes, ketones, carboxylic acids and esters;Conjugated dienes: alicyclic, homoannular and heteroannular; Extended conjugated systems (aldehydes, ketones and dienes); distinction between cis and trans isomers.	**8**	**First & Second week January**	**Numerical Solving** **Doubt Session**
IR Spectroscopy: Fundamental and non-fundamental molecular vibrations; IR absorption positions of O, N and S containing functional groups; Effect of H-bonding, conjugation, resonance and ring size on IR absorptions; Fingerprint region and its significance; application in functional group analysis.	**8**	**Third & Fourth week January**	**Numerical Solving** **Doubt Session** **Assignment Distribution**
NMR Spectroscopy: Basic principles of Proton Magnetic Resonance, chemical shift and factors influencing it; Spin – Spin coupling and coupling constant; Anisotropic effects in alkene, alkyne, aldehydes and aromatics, Interpetation of NMR spectra of simple compounds. Applications of IR, UV and NMR for identification of simple organic molecules.	**8**	**First & Second week February**	**Numerical Solving** **Doubt Session** **University Papers Discussion**
Carbohydrates Occurrence, classification and their biological importance. Monosaccharides: Constitution and absolute configuration of glucose and	**10**	**Third week February- First week March**	**Doubt Session** **University Papers Discussion**

fructose, epimers and anomers, mutarotation, determination of ring size of glucose and fructose, Haworth projections and conformational structures; Interconversions of aldoses and ketoses; Killiani- Fischer synthesis and Ruff degradation; Disaccharides–Structure elucidation of maltose, lactose and sucrose. Polysaccharides–Elementary treatment of starch, cellulose and glycogen.			
Dyes Classification, Colour and constitution; Mordant and Vat Dyes; Chemistry of dyeing; Synthesis and applications of: Azo dyes-Methyl orange; Triphenyl methane dyes - Malachite green and Rosaniline ; Phthalein Dyes - Phenolphthalein; Natural dyes–structure elucidation and synthesis of Alizarin and Indigotin; Edible Dyes with examples.	**8**	**Second & Third week March**	**Doubt Session** **Assignment Collection**
Polymers Introduction and classification including di-block, tri-block and amphiphilic polymers; Polymerisation reactions -Addition and condensation - Mechanism of cationic, anionic and free radical addition polymerization; Metallocene-based Ziegler-Natta polymerisation of alkenes; Preparation and applications of plastics – thermosetting (phenol-formaldehyde, Polyurethanes) and thermosoftening (PVC, polythene);Fabrics – natural and synthetic (acrylic, polyamido, polyester); Rubbers – natural and synthetic: Buna-S, Chloroprene and Neoprene; Vulcanization; Polymer additives; Introduction to; biodegradable and conducting polymers with examples.	**8**	**First & Second week April**	**Doubt Session** **Paper Discussion**