

**Curriculum Plan (Even Semester 2021-22)**

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

**UPC: 32171602**

**Paper Name: Organic Chemistry V: Spectroscopy and Applied Organic Chemistry (LOCF)**

**Teacher Name: Dr. Renu Bala & Dr. Meenakshi Verma**

**Month: January-April 2022**

<b>Contents</b>	<b>Allocation of Lectures</b>	<b>Month wise schedule to be followed</b>	<b>Tutorial/Assignments /Presentation etc</b>
<p><b>UNIT 1: Organic Spectroscopy</b></p> <p>General principles Introduction to absorption and emission spectroscopy. <b>UV Spectroscopy:</b> Types of electronic transitions, <math>\lambda_{max}</math>, Chromophores and Auxochromes, Bathochromic and Hypsochromic shifts, Intensity of absorption; Application of Woodward Rules for calculation of <math>\lambda_{max}</math> for the following systems: <math>\alpha,\beta</math>-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 by UV</p>	<b>8</b>	<p><b>First week</b> <b>January-</b> <b>Fourth week</b> <b>January</b></p>	<p><b>Syllabus Overview</b> <b>References Books</b> <b>Lectures</b> <b>Numerical Solving</b> <b>Doubt Session</b></p>
<p><b>IR Spectroscopy:</b> 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 of IR in functional group analysis.</p>	<b>8</b>	<p><b>First week</b> <b>February-</b> <b>Fourth week</b> <b>February</b></p>	<p><b>Lectures</b> <b>Numerical Solving</b> <b>Doubt Session</b> <b>Assignment</b> <b>Distribution</b></p>
<p><b>NMR Spectroscopy:</b> Basic principles of Proton Magnetic Resonance, chemical shift and factors influencing it; Equivalent and non-equivalent protons, Spin – Spin coupling and coupling constant; Anisotropic effects in alkene, alkyne, aldehydes and aromatics, Interpretation of NMR spectra of simple compounds. Applications of IR, UV and NMR for identification of simple organic molecules.</p>	<b>14</b>	<p><b>First week</b> <b>March-</b> <b>Fourth week</b> <b>April</b></p>	<p><b>Lectures</b> <b>Assignment</b> <b>Class Test</b> <b>Doubt Session</b> <b>Numerical Solving</b> <b>Previous Years</b> <b>University Papers</b> <b>Discussion</b></p>
<b>UNIT 2: Dyes</b>	<b>8</b>	<b>First week</b>	<b>Syllabus Overview</b>

<p>Classification, Colour and constitution; Mordant and Vat Dyes; Chemistry of dyeing. Synthesis and applications of Azo dyes – Methyl orange, Congo red; Triphenyl methane dyes-Malachite green, Rosaniline and Crystal violet; Phthalein Dyes – Phenolphthalein; Natural dyes –Structure elucidation and synthesis of Alizarin and Indigotin; Edible Dyes with examples.</p>		<p><b>January- Fourth week January</b></p>	<p><b>References Books</b> <b>Lectures</b> <b>Class discussion</b></p>
<p><b>Unit 3: Pharmaceutical Compounds</b> Classification, structure and therapeutic uses of antipyretics - Paracetamol (with synthesis); Analgesics Ibuprofen (with synthesis); Antimalarials - Chloroquine (with synthesis); Antitubercular drugs - Isoniazid. An elementary treatment of Antibiotics and detailed study of chloramphenicol, Medicinal values of curcumin (haldi), azadirachtin (neem), vitamin C and antacid (ranitidine).</p>	<p><b>10</b></p>	<p><b>First week February- Second week March</b></p>	<p><b>Lectures</b> <b>Class discussion</b> <b>Assignment Distribution</b></p>
<p><b>Unit 4: Polymers</b> Introduction and classification including di-block, tri-block and amphiphilic polymers; weight average molecular weight, number average molecular weight, glass transition temperature (T<sub>g</sub>) of polymers; Polymerisation reactions -Addition and condensation. Mechanism of cationic, anionic and free radical addition polymerization; Ziegler-Natta polymerisation of alkenes. Preparation and applications of plastics – thermosetting (phenol-formaldehyde, Polyurethanes) and thermosoftening (PVC, polythene); Fabrics – natural and synthetic (acrylic, polyamide, polyester). Rubbers – natural and synthetic, Buna-S, Chloroprene and Neoprene. Vulcanization - Polymer additives; Introduction to Biodegradable and conducting polymers with examples.</p>	<p><b>12</b></p>	<p><b>Third week March – Fourth week April</b></p>	<p><b>Lectures</b> <b>Assignment</b> <b>Class Test</b> <b>Doubt Session</b> <b>Presentations</b> <b>Numerical Solving</b> <b>Previous Years University Papers Discussion</b></p>

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