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

**Teacher Name: Dr. Anjali Sehrawat**

**Course: BSc. (H) Chemistry , II year (Semester IV)**

**Paper Name: Carbohydrates, Lipids and Heterocyclic compounds (NEP) (3 periods per week)**

**UPC: 2172012402**

| **Contents** | **Allocation of lectures** | **Month wise schedule to be followed** | **Tutorial/Assignments/**  **Presentations etc.** |
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| **UNIT 1: Carbohydrates and Lipids**  **Carbohydrates:** Monosaccharides: Constitution and absolute configuration of glucose and fructose, epimers and anomers, mutarotation, determination of ring size of glucose and fructose, Haworth projection and conformational structures; Interconversion of aldoses and ketoses; Killiani-  Fischer synthesis and Ruff degradation; Linkage between monosaccharides: Comparative study of the structure of disaccharides (sucrose, maltose, lactose) and polysaccharides (starch, cellulose and glycogen) excluding their structure elucidation. Reactions of disaccharides- reducing property, hydrolysis, methylation and acetylation | **15** | **3rd week of January- 2nd week of February** | * **Syllabus Overview** * **References Books** * **Lectures** * **Doubt Session** |
| **Lipids:** Introduction to lipids, classification. Oils and fats: Common fatty acids present in oils and fats, Omega-3&6 fatty acids, trans fats, hydrogenation, hydrolysis, acid value, saponification value, iodine number. Biological importance of triglycerides, phospholipids,  glycolipids, and steroids (cholesterol). | **9** | **3rd week of February - 4th week of February** | * **Lectures** * **Class discussion** * **Class test** |
| **Unit-2: Heterocyclic Compounds**  Classification and nomenclature of heterocyclic compounds (containing only one hetero atom). Structure, aromaticity in 5-membered and 6-membered rings containing one heteroatom; Basicity and relative reactivity towards electrophilic substitution reactions (amongst five membered and six membered rings | **6** | **1st week of March- 2nd week of March** | * **Lectures** * **Problem solving** * **Class discussion** * **Assignment distribution** |
| **General methods of synthesis for**: furan, thiophene, pyrrole  (Paal-Knorr synthesis, pyridine (Hantzsch synthesis), indole (Fischer Indole synthesis), quinoline (Skraup synthesis, Friedlander’s synthesis, Knorr quinoline synthesis, Doebner -Miller synthesis. | **6** | **3rd week of March-**  **1st week of April** | * **Lectures** * **Problem solving** |
| **Properties**: Physical properties, discussion on the following reaction (with mechanism) for  furan, pyrrole, thiophene, pyridine, indole and quinoline: Electrophilic substitution - nitration, sulphonation, halogenation, formylation, acylation, mercuration and carboxylation. Oxidation,  reduction, addition, reactions showing acidic /basic character, reaction with diazonium salts,  ring opening, ring expansion and nucleophilic substitution reaction wherever applicable. | **9** | **2nd week of April-**  **4th week of April** | * **Lectures** * **Doubt session** * **Discussion of previous years university question papers** |

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