

4260-ORGANIC CHEMISTRY										
Teaching Schedule Per Week			Progressive Assessment		Examination Schedule (Marks)					
Lectures	Practical	Credits			Theory		Practical Ex.		Total	
2	3	5	25	25	3 hrs.	100	50		200	
Pre-requisite		Source	Semester	Theory	Test	Total	TW	PR	Gr Total	
Nil		FOD		75	25	100	25	50	175	++

Rationale: Knowledge of Organic Chemistry is very essential for the study of Food Chemistry, Biochemistry and Nutrition and Food Technology in the higher semesters. The various food commodities are composed of organic substances and to have proper understanding of their nature and properties as well as the changes occurring during processing, it is necessary to have adequate knowledge of the nature and properties of organic molecules. This course in Organic Chemistry covers the various classes of organic compounds including their structural formulae, nomenclature, physical and chemical properties. The topics in theory are supplemented with practical work aimed at developing skills in the students for systematic analysis, which would be necessary for quality control testing in the higher semesters.

COURSE CONTENT		Hrs	Mks
1. CLASSIFICATIONS AND SYSTEMATIC NOMENCLATURE.		8	30
Classification into compounds: Acyclic or open chain, Cyclic or Ring Compounds comprising of Carboxylic and Hetero-cyclic compounds.			
Open Chain compounds: Classes of hydrocarbons; Definitions and general structure, saturated and unsaturated compounds with examples. Functional groups: Types of functional groups in organic compounds. Homologous series: Definition, characteristics, examples of various classes of compounds such as hydrocarbons, halogen compounds, alcohol's, aldehydes, ketones, acids, esters etc.			
Nomenclature: I. U. P. A. C. system of nomenclature with common name and systematic name of alkanes, alkynes, halogen Compounds, alcohols and other classes of aliphatic compounds. I. U. P. A. C. rules of naming hydrocarbon chain compounds and functional compounds i.e. mono-functional and poly-functional.			

2. ALIPHATIC COMPOUNDS.

14 40

Alkenes: General formula and structure with reference to methane, types of carbon atoms in alkanes, i.e. primary, secondary, tertiary, quaternary, isomerism in alkanes taking butane as example, occurrence in nature, physical and chemical properties of alkenes taking methane as example; Halogenations, Nitration, Sulphonation, Oxidation.

Alkenes: Physical and chemical properties of alkanes taking Ethylene as example; Addition of hydrogen, halogen acid, oxygen, oxidation reaction, substitution reaction.

Alkynes: Physical and chemical properties of alkynes taking acetylene as examples: Addition of halogen, halogen acid, water, hydrogen, oxidation reaction, polymerisation reaction.

Halogen Derivatives: Examples with structure of mono, di, tri and tetra halogen derivatives.

Aliphatic Alcohol: Definition, examples with and structure of monohydric, dihydric and trihydric alcohols. Method of production of ethyl alcohol by fermentation from Molasses, Starchy materials other methods of production of ethyl alcohol: Hydrolysis of alkyl ethyl halides, Hydration of alkenes, Hydrolysis of esters. Types of alcohol: Primary, Secondary and Tertiary alcohols. Physical and Chemical properties of alcohols: Action of acids, Oxidation of alcohols.

Aldehydes: Structural formula and examples, oxidation and reduction reaction aldehydes taking acetaldehyde as examples.

Ketones: Structural formula and examples of simple and mixed Ketones, oxidation and reduction reactions of ketones, taking acetone as example.

Carboxylic acids: Structural formula and examples of mono, di and tri-carboxylic acids. Physical and chemical properties of mono-carboxylic Halogenations, oxidation - Reduction Formation of Esters, Formation of Aldehydes and Ketones.

Ethers: Structural formula and examples of simple and mixed ethers.

Aliphatic Amines: Structural formula and examples of primary, secondary and Aliphatic tertiary Amines.

Esters: Structural formula and examples, methods of production of ester from alcohol and acid. Physical and chemical properties of esters taking Ethyl-acetate as example.

3. AROMATIC COMPOUNDS:

10 30

Meaning of the term 'Aromatic'. Sources of aromatic compounds. Benzene: Structure of benzene (Kakule's structure), Homologues (side chain derivatives) of benzene: Toluene, Halogen derivative, xylene (structure with ortho, meta, and para position). Aryl radical: Examples with structure formula of phenyl, benzyl and benzal radical. Methods of production benzene: Production of coal, polymersiation of acetylene, and distillation of sodium benzonate with soda lime. Physical and chemical properties of benzene: Reactions of benzene with hydrogen, halogen, nitration of benzene, sulphonation of benzene, Friedel crafts reaction. Physical and chemical properties of Toluene: Halogenation, nitration, sulphonation and oxidation.

Total**32 100****PRACTICALS:**

Qualitative tests for identifying carbon, nitrogen, oxygen, phosphorous, chlorine.

Identification of organic compounds:

Simple qualitative tests for analysis of functional groups.

REFERENCE BOOKS:

Text Book of Organic Chemistry by B. S. Bahl.

Elementary Organic Chemistry by R. A. Kulkarni, R. V. Bhagwat, C. T. Bhastana.