VIDHYADEEP UNIVERSITY

VIDHYADEEP INSTITUTE OF PHARMACY, ANITA, SURAT

B. PHARMACY SEMESTER: II

Subject Name: Pharmaceutical Organic Chemistry I

Subject Code: BP202TP

Scope: This subject deals with classification and nomenclature of simple organic compounds, structural isomerism, intermediates forming in reactions, important physical properties, reactions and methods of preparation of these compounds. The syllabus also emphasizes on mechanisms and orientation of reactions.

Course Outcomes: Upon completion of this course the student should be able to

CO	STATEMENTS
C109.1	To understand the classification of organic compounds, IUPAC system and Isomerism
C109.2	To discuss the reactivity, stability and method of preparations of alkanes, alkenes and conjugated diene
C109.3	To clear concept of the reactivity, method of preparation, name reaction, structure and use of alkyl halide and identify the organic compound.
C109.4	To describe the reactivity, method of preparation, qualitative tests, structure and use of alcohol and identify the organic compound.
C109.5	To know the reactivity, method of preparation, name reaction, qualitative tests, structure and use of carbonyl compounds and identify the organic compound.
C109.6	To explain the reactivity, method of preparation, name reaction, qualitative tests, structure and use of Carboxylic acids and Aliphatic amines and identify the organic compound.

Teaching scheme and examination scheme:

Teaching Scheme (hr./ Week)				Evaluation Scheme			
Theory	Tutorial	Practical	Total	Internal	External	Internal	External
				Theory Exam		Practical Exam	
3	1	4	8	25	75	25	75

Sr No	Course content	(Hrs.)
1	**Classification, nomenclature and isomerism:** Classification of Organic Compounds Common and IUPAC systems of nomenclature of organic compounds (up to 10 Carbons open chain and carbocyclic compounds) Structural isomerisms in organic compounds	07
2	**Alkanes*, Alkenes* and Conjugated dienes*:** SP hybridization in alkanes, Halogenation of alkanes, uses of paraffins, Stabilities of alkenes, SP hybridization in alkenes, E1 and E2 reactions – kinetics, order of reactivity of alkyl halides, rearrangement of carbocations, Saytzeffs orientation and evidences. E1 verses E2 reactions, Factors affecting E1 and E2 reactions. Ozonolysis, electrophilic addition reactions	10

	of alkenes, Markownikoff's orientation, free radical addition reactions of alkenes, Anti Markownikoff's orientation. Stability of conjugated dienes, Diel-Alder, electrophilic addition, free radical addition reactions of conjugated dienes, allylic rearrangement	
3	**Alkyl halides*:** SN1 and SN2 reactions - kinetics, order of reactivity of alkyl halides, stereochemistry and rearrangement of carbocations SN1 versus SN2 reactions, Factors affecting SN1 and SN2 reactions Structure and uses of ethylchloride, Chloroform, trichloroethylene, tetrachloroethylene, dichloromethane, tetrachloromethane and iodoform **Alcohols*-** Qualitative tests, Structure and uses of Ethyl alcohol, Methyl alcohol, chlorobutanol, Cetosteryl alcohol, Benzyl alcohol, Glycerol, Propylene glycol	**10**
4	**Carbonyl compounds*** (Aldehydes and ketones): Nucleophilic addition, Electromeric effect, aldol condensation, Crossed Aldol condensation, Cannizzaro reaction, Crossed Cannizzaro reaction, Benzoin condensation, Perkin condensation, qualitative tests, Structure and uses of Formaldehyde, 10 Paraldehyde, Acetone, Chloral hydrate, Hexamine, Benzaldehyde, Vanilin, Cinnamaldehyde	**10**
5	**Carboxylic acids*:** Acidity of carboxylic acids, effect of substituents on acidity, inductive effect and qualitative tests for carboxylic acids,amide and ester Structure and Uses of Acetic acid, Lactic acid, Tartaric acid, Citric acid, Succinic acid. Oxalic acid, Salicylic acid, Benzoic acid, Benzyl benzoate, Dimethyl phthalate, Methyl salicylate and Acetyl salicylic acid Aliphatic amines* - Basicity, effect of substituent on Basicity. Qualitative test, Structure and uses of Ethanolamine, Ethylenediamine, Amphetamine	**08**

Course Content: General methods of preparation and reactions of compounds superscripted with asterisk (*) to be explained to emphasize on definition, types, classification, principles/mechanisms, applications, examples and differences

Practical

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Subject Code: BP202TP (Practical)

Systematic qualitative analysis of unknown organic compounds like:

1. Preliminary test: Color, odour, aliphatic/aromatic compounds, saturation and unsaturation, etc.
2. Detection of elements like Nitrogen, Sulphur and Halogen by Lassaigne's test.
3. Solubility test.
4. Functional group test like Phenols, Amides/ Urea, Carbohydrates, Amines, Carboxylic acids, Aldehydes and Ketones, Alcohols, Esters, Aromatic and Halogenated Hydrocarbons, Nitro compounds and Anilides.
5. Melting point/Boiling point of organic compounds.
6. Identification of the unknown compound from the literature using melting point/ boiling point.
7. Preparation of the derivatives and confirmation of the unknown compound by melting point/ boiling point.
8. Minimum 5 unknown organic compounds to be analysed systematically.
9. Preparation of suitable solid derivatives from organic compounds.
10. Construction of molecular models

Recommended Books (Latest Editions)

1. Organic Chemistry by Morrison and Boyd.
2. Organic Chemistry by I.L. Finar , Volume-I.
3. Textbook of Organic Chemistry by B.S. Bahl & Arun Bahl.
4. Organic Chemistry by P.L.Soni.
5. Practical Organic Chemistry by Mann and Saunders.
6. Vogel's text book of Practical Organic Chemistry.

7. Advanced Practical organic chemistry by N.K.Vishnoi.
8. Introduction to Organic Laboratory techniques by Pavia, Lampman and Kriz.
9. Reaction and reaction mechanism by Ahluwaliah/Chatwal.