



SILVER OAK UNIVERSITY
SILVER OAK COLLEGE OF PHARMACY (067)
Programme Name: B. Pharm (18)
Subject Name: Pharmaceutical Organic Chemistry-I
Subject Code: 1180673106
Semester: II

Prerequisite:

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.

Objectives: Upon completion of the course the student shall be able to

1. write the structure, name and the type of isomerism of the organic compound
2. write the reaction, name the reaction and orientation of reactions
3. account for reactivity/stability of compounds,
4. identify/confirm the identification of organic compound

Teaching Scheme:

Teaching Scheme				
L	T	P	Contact Hours	Credit
3	1	4	8	6

Content:

Unit No.	Contents	Teaching Hours	Weightage %
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 isomerism in organic compounds	07	16%
2	Alkanes*, Alkenes* and Conjugated dienes* SP ³ hybridization in alkanes, Halogenation of alkanes, uses of paraffins. Stabilities of alkenes, SP ² 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	10	22%

	<p>reactions. Ozonolysis, electrophilic addition reactions of alkenes, Markownikoff's orientation, free radical addition reactions of alkenes, Anti Markownikoff's orientation.</p> <p>Stability of conjugated dienes, Diel-Alder, electrophilic addition, free radical addition reactions of conjugated dienes, allylic rearrangement</p>		
3	<p>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 ethyl chloride, Chloroform, trichloroethylene, tetrachloroethylene, dichloromethane, tetrachloromethane and iodoform.</p> <p>Alcohols*- Qualitative tests, Structure and uses of Ethyl alcohol, Methyl alcohol, chlorobutanol, Cetosteryl alcohol, Benzyl alcohol, Glycerol, Propylene glycol</p>	10	22%
4	<p>Carbonyl compounds* (Aldehydes and ketones)</p> <p>Nucleophilic addition, Electromeric effect, aldol condensation, Crossed Aldol condensation, Cannizzaro reaction, Crossed Cannizzaro reaction, Benzoin condensation, Perkin condensation, qualitative tests,</p> <p>Structure and uses of Formaldehyde, Paraldehyde, Acetone, Chloral hydrate, Hexamine, Benzaldehyde, Vanilin, Cinnamaldehyde</p>	10	22%
5	<p>Carboxylic acids* Acidity of carboxylic acids, effect of substituents on acidity, inductive effect and qualitative tests for carboxylic acids, amide and ester</p> <p>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</p> <p>Aliphatic amines* - Basicity, effect of substituent on Basicity. Qualitative test, Structure and uses of Ethanolamine, Ethylenediamine, Amphetamine</p>	08	18%

Course Outcome: After Completion of Syllabus Students will able to

Sr. No.	CO statement	Unit No
CO-1	To know how to classify different organic compounds.	1
CO-2	Detail understanding of alkane, alkene, and conjugated dienes	2
CO-3	To have been introduced to alkyl halides and alcohol	3
CO-4	To gain knowledge about carbonyl compound.	4
CO-5	To understand carboxylic acid and aliphatic amines	5

Teaching & Learning Methodology: -

The various methods or tools follows by the faculties to teach the above subject are:

1. Chalk and board method
2. Experiential learning.
3. Power point presentation and slide show method

Experiments:

Students will perform following Experiments.

1. 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 analyzed systematically.
2. Preparation of suitable solid derivatives from organic compounds
 3. Construction of molecular models

Books Recommended: -

1. Morrison and Boyd, Organic Chemistry
2. I.L. Finar, Organic Chemistry Volume-I
3. B.S. Bahl & Arun Bahl, Textbook of Organic Chemistry
4. P.L.Soni, Organic Chemistry
5. Mann and Saunders, Practical Organic Chemistry.
6. Vogel's text book of Practical Organic Chemistry
7. N.K.Vishnoi., Advanced Practical organic chemistry
8. Pavia, Lampman and Kriz. Introduction to Organic Laboratory techniques
9. Ahluwalia/Chatwal Reaction and reaction mechanism

CO-PO-PSO Matrix:

Co. No.	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO9	PO10	PO11	PSO 1	PSO 2
CO-1	3	2	2	2	-	2	-	2	-	3	2	2	3
CO-2	3	2	2	2	-	2	-	2	-	3	2	3	3
CO-3	3	2	2	2	-	2	-	2	-	2	3	2	3
CO-4	3	2	2	2	-	2	-	2	2	2	2	3	2
CO-5	3	2	2	2	-	3	-	2	2	2	2	3	2