

Subject Code: BP202T	Subject Title: Pharmaceutical Organic Chemistry-I (Theory)
Pre-requisite: --	

Course Objective: Upon completion of this course, the students would be able to

1. Assign nomenclature to structure as per IUPAC system.
2. Identify the type of isomerism of the organic compound.
3. Write the reaction with their reactivity, stability, and orientation.
4. Enumerate the preparations, reactions and uses of important organic compounds.

Teaching Scheme (Hours per week)			Evaluation Scheme (Marks)			
Lecture	Tutorial	Credit	Theory			Total
			University Assessment	Continuous Assessment	Internal Assessment	
3	1	4	75	10	15	100

Detailed Syllabus:

Sr. No.	UNIT	Hours	Weightage (%)
1.	<p>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</p>	7 Hours	15.55%
2.	<p>Alkanes*, Alkenes* and Conjugated dienes* SP³ hybridization in alkanes, Halogenation of alkanes, uses of paraffins. Stabilities of alkenes, SP² hybridization in alkenes E₁ and E₂ reactions – kinetics, order of reactivity of alkyl halides, rearrangement of carbocations, Saytzeffs orientation and evidence. E₁ versus E₂ reactions, Factors affecting E₁ and E₂ reactions. Ozonolysis, electrophilic addition reactions 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</p>	10 Hours	22.22%

	dienes, allylic rearrangement		
3.	<p>Alkyl halides* SN^1 and SN^2 reactions - kinetics, order of reactivity of alkyl halides, stereochemistry, and rearrangement of carbocations. SN^1 versus SN^2 reactions, Factors affecting SN^1 and SN^2 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 Hours	22.22%
4.	<p>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, Paraldehyde, Acetone, Chloral hydrate, Hexamine, Benzaldehyde, Vanilin, Cinnamaldehyde.</p>	10 Hours	17.77%
5.	<p>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.</p> <p>Aliphatic amines*: Basicity, effect of substituent on Basicity. Qualitative test, Structure and uses of Ethanolamine, Ethylenediamine, Amphetamine.</p>	8 Hours	17.77%

Note: General method of preparations and reactions of compounds superscripted with asterisk to be explained.

Subject Code: BP202P	Subject Title: Pharmaceutical Organic Chemistry-I (Practical)
Pre-requisite: --	

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

1. Identify the nature of organic compounds.
2. Prepare various derivatives of organic compounds.
3. Interpret the stereo models of organic compounds.
4. Analyze the problem, communicate suggested solution and interpret the results.

Teaching Scheme (Hours per week)		Evaluation Scheme (Marks)			
Practical	Credit	Theory			Total
		University Assessment	Continuous Assessment	Internal Assessment	
4	2	35	5	10	50

List of Practical:

Sr. No.	Title of the unit
1.	<ul style="list-style-type: none"> • Systematic qualitative analysis of unknown organic compounds like Preliminary test: Color, odour, aliphatic/aromatic compounds, saturation and unsaturation, etc. • Detection of elements like Nitrogen, Sulphur and Halogen by Lassaigne's test • Solubility test • Functional group tests like Phenols, Amides/ Urea, Carbohydrates, Amines, Carboxylic acids, Aldehydes and Ketones, Alcohols, Esters, Aromatic and Halogenated Hydrocarbons, Nitro compounds and Anilides. • Melting point/Boiling point of organic compounds • Identification of the unknown compound from the literature using melting point/ boiling point. • Preparation of the derivatives and confirmation of the unknown compound by melting point/ boiling point. • Minimum 5 unknown organic compounds to be analyzed systematically.
2.	Preparation of suitable solid derivatives from organic compounds
3.	Construction of molecular models

Recommended Study Material:

1. Organic Chemistry, Morrison and Boyd, Pearson Education, India
2. Organic Chemistry, I.L. Finar , Volume-I, Pearson Education, India
3. Textbook of Organic Chemistry, B.S. Bahl & Arun Bahl, S. Chand Publisher
4. Organic Chemistry, P. L. Soni, Sultan Chand & Sons Publisher
5. Practical Organic Chemistry, Mann and Saunders, Pearson Education, India
6. Vogel's textbook of Practical Organic Chemistry, Pearson Education, India
7. Advanced Practical Organic Chemistry. N. K. Vishnoi, S. Chand Publisher
8. Introduction to Organic Laboratory techniques, Pavia, Lampman and Kriz., Brooks/Cole
9. Reaction and reaction mechanism Ahluwalia/Chatwal.
10. Reaction and reaction mechanism, P. S. Kalsi, New Age International Publisher
11. Textbook of Organic, Medicinal and Pharmaceutical Chemistry, Willson & Gisvolds, Walter Kluwer India Pvt. Ltd.
12. Organic Chemistry, Bhupinder Mehta and Manju Mehta, PHI
13. Organic Chemistry, Jonathan Clayden, Nick Greeves & Stuart Warren, Oxford University Press.