

**ST. JAMES COLLEGE OF PHARMACEUTICAL SCIENCES
ST. JAMES MEDICAL ACADEMY
RIVER BANK, CHALAKUDY**

PROGRAMME:	B. PHARM	SEM.:	SECOND
NAME OF COURSE: (SUBJECT)	PHARMACEUTICAL ORGANIC CHEMISTRY I	COURSE CODE:	BP202T
TEACHING FACULTY OF THE COURSE	SILVIPRIYA K S		

SUMMARY OF THE LECTURE PLAN

TOPIC	LECTURES	HOURS
Classification, nomenclature and isomerism	Classification of Organic Compounds.	1
	Common system of nomenclature of organic compounds.	1
	IUPAC system of nomenclature of organic compounds.	1
	Structural isomerisms in organic compounds.	1
Alkanes, Alkenes and Conjugated dienes	Introduction to Alkanes, preparations & reactions.	2
	Introduction to Alkenes, preparations & reactions.	2
	Introduction to conjugated dienes, preparations & reactions.	2
	Hybridization concept introduction.	2
Alkyl halides	Introduction to Alkanes, preparations & reactions.	2
	SN1 and SN2 reactions	2
	E1 and E2 reactions	2
	Structure and uses of selected alkyl halides	1
Alcohols	Introduction to Alcohols, preparations & reactions.	2
	Qualitative & Distinguishing tests	1

	Structure and uses of selected alcohols.	1
Carbonyl compounds (Aldehydes and ketones)	Introduction to Aldehydes, preparations & reactions.	2
	Qualitative & Distinguishing tests	2
	Introduction to ketones, preparations & reactions.	6
	Qualitative & Distinguishing tests	1
	Named reactions: mechanism and applications.	2
Carboxylic acids	Introduction to carboxylic acids, preparations & reactions.	2
	Qualitative tests.	1
	Structure and uses of selected carboxylic acids	1
	Introduction to amides and esters.	1
Aliphatic amines	Introduction to aliphatic amines, preparations & reactions.	2
	Qualitative & Distinguishing tests	1
	Structure and uses of selected aliphatic amines.	1

MAJOR ISSUES OR CORE ASPECTS TO BE ADDRESSED/ COVERED:

TOPIC TITLE
Classification, nomenclature and isomerism
Classification of Organic Compounds.
Common system of nomenclature of organic compounds.
IUPAC system of nomenclature of organic compounds.
Isomerisms in organic compounds.
TOPIC TITLE
Alkanes, Alkenes and Conjugated dienes
Alkanes: Hybridization concept introduction
Introduction to Alkanes, preparations & reactions.
SP ³ hybridization in alkanes
Halogenation of alkanes.
Uses of paraffins.
Alkenes: Introduction to Alkenes, preparations & reactions.
Stabilities of alkenes

SP ² hybridization in alkenes
Electrophilic addition reactions of alkenes
Markownikoff's orientation,
Free radical addition reactions of alkenes
Anti Markownikoff's orientation
Conjugated dienes : Introduction to conjugated dienes, preparations & reactions.
Stability of conjugated dienes.
DielAlder reaction.
Electrophilic addition reaction.
Free radical addition reactions of conjugated dienes.
Allylic rearrangement.
TOPIC TITLE
Alkyl halides
Introduction to Alkanes, preparations & reactions.
SN ₁ and SN ₂ reactions
E ₁ and E ₂ reactions
Structure and uses of selected alkyl halides
TOPIC TITLE
Alcohols
Introduction to Alcohols, preparations & reactions.
Qualitative & Distinguishing tests
Introduction to Alcohols, preparations & reactions.
Structure and uses of selected alcohols.
TOPIC TITLE
Carbonyl compounds (Aldehydes and ketones)
Introduction to Aldehydes, preparations & reactions.
Nucleophilic addition reaction. Electromeric effect.
Mechanism and applications of named reactions such as aldol condensation, Crossed Aldol condensation, Cannizzaro reaction, Crossed Cannizzaro reaction, Benzoin condensation, Perkin condensation.

Qualitative & Distinguishing tests
Introduction to ketones, preparations & reactions.
Qualitative & Distinguishing tests
TOPIC TITLE
Carboxylic acids
Introduction to carboxylic acids, preparations & reactions.
Acidity of carboxylic acids & effect of substituents on acidity
Inductive effect.
Qualitative tests.
Structure and uses of selected carboxylic acids
Introduction to amides and esters.
Introduction to carboxylic acids, preparations & reactions.
TOPIC TITLE
Aliphatic amines
Introduction to aliphatic amines, preparations & reactions.
Basicity & effect of substituent on Basicity of amines.
Qualitative & Distinguishing tests
Structure and uses of selected aliphatic amines.
Storage conditions, precautions & pharmaceutical application of radioactive substances.
Different methods for measurement of radioactivity.

SAMPLE QUESTIONS

TOPIC TITLE
Classification, nomenclature and isomerism
Define isomerism and elaborate different types with examples.
Write the IUPAC names of the following compounds a. $\text{CH}_3 - \text{CH}(\text{CH}_3) - \text{CH}_2 - \text{COOH}$ b. $\text{CH}_3 - \text{CH} = \text{CH} - \text{CHO}$
Write structural formulas from names: a. 3 - Hydroxy propanoic acid b. 1,4 - Pentadiene
Structural isomerism in organic compounds.

Classification of organic compounds.
Priority chart for principle functional groups.
Define isomerism and classify isomers.
TOPIC TITLE
Alkanes, Alkenes and Conjugated dienes
Explain SP ² hybridization.
Write a note on the stability of conjugated dienes.
Discuss the mechanism involved in chlorination of methane
What is hybridization.
The presence of little amount of oxygen retards chlorination of methane. Why?
Briefly explain Diel's - Alder reaction
Stability and electrophilic addition of conjugated dienes.
Electromeric effect.
Define hybridization. Explain the structure of methane and ethane.
Stability of alkene.
Any 2 method of preparation of alkenes. Any four methods of preparation of alkanes.
Explain catalytic hydrogenation with mechanism.
Any 2 method of preparation of alkenes.
Uses of paraffin.
Add a note on walden inversion.
TOPIC TITLE
Alkyl halides
Explain nucleophilic aliphatic substitution reactions with suitable examples. Add a note on walden inversion.
Discuss the mechanism involved in chlorination of methane
Write the structure and uses of Iodoform
Explain SN ¹ and SN ² reaction with suitable examples.
Markownikoff's rule.
Factors affecting SN ² reaction.
Difference between SN ¹ and SN ² reaction.
Any 2 methods of preparation of alkyl halides.
Kharasch effect with example.

Saytzeff rule.
Give any three preparation and reactions of alkyl halides.
TOPIC TITLE
Alcohols
Preparation of alcohol.
Qualitative test for alcohol.
Distinguishing tests for alcohols.
TOPIC TITLE
Carbonyl compounds (Aldehydes and ketones)
Discuss the mechanism involved in perkin's reaction and cannizaro reaction
Why aldehydes are more reactive than ketones in nucleophilic addition reaction
What is Aldol condensation
Qualitative test for aldehydes.
Structure and uses of paraldehyde and cinnamaldehyde.
Exemplify nucleophilic addition reaction with mechanism.
Mention any three important methods of preparation of carbonyl compounds.
Qualitative tests for carbonyl compounds.
TOPIC TITLE
Carboxylic acids
List any three methods for the preparation of carboxylic acids.
Explain the acidity of carboxylic acid in detail.
Any three chemical reactions of carboxylic acids.
Structure and uses of salicylic acid and tartaric acid.
Qualitative test for carboxylic acid.
Inductive effect.
Carboxylic acids are more acidic than alcohol. Give reason.
Note on structure and acidity of carboxylic acids along with the effect of substituents on acidity.
TOPIC TITLE
Aliphatic amines
Explain the basicity of amines

Detailed note on structure and basicity of amines along with the effect of substituents on basicity.

Hoffmann rearrangement reaction.

Any five methods of preparation of amines.

Distinguishing tests for amines.