

4th SEMESTER

Course Code	Course Title	Teaching Load			Marks		Exam (hrs)		Credits
		L	T	P	Int.	Ext.	Int.	Ext.	
BP401T	Pharmaceutical Organic Chemistry – III	3	1	-	25	75	1	3	4

Scope: This subject imparts knowledge on stereo-chemical aspects of organic compounds and organic reactions, important named reactions, chemistry of important heterocyclic compounds. It also emphasizes on medicinal and other uses of organic compounds.

Objectives: At the end of the course, the student shall be able to

1. Understand the methods of preparation and properties of organic compounds.
2. Explain the stereo chemical aspects of organic compounds and stereo chemical reactions.
3. Know the medicinal uses and other applications of organic compounds.

Note: To emphasize on definition, types, mechanisms, examples, uses/applications

Module 01

10 Hours

Stereo Isomerism

- Optical isomerism – Optical activity, enantiomerism, diastereoisomerism, meso compounds.
- Elements of symmetry, chiral and achiral molecules.
- DL system of nomenclature of optical isomers, sequence rules, RS system of nomenclature of optical isomers.
- Reactions of chiral molecules.
- Racemic modification and resolution of racemic mixture.
- Asymmetric synthesis: partial and absolute.

Module 02

10 Hours

Geometrical Isomerism

- Nomenclature of geometrical isomers (Cis Trans, EZ, Syn Anti systems).
- Methods of determination of configuration of geometrical isomers.
- Conformational isomerism in Ethane, n-Butane and Cyclohexane.
- Stereo isomerism in biphenyl compounds (Atropisomerism) and conditions for optical activity.
- Stereospecific and stereoselective reactions.

Module 03

10 Hours

Heterocyclic Compounds

- Nomenclature and classification.
- Synthesis, reactions and medicinal uses of following compounds/derivatives.

- Pyrrole, Furan, and Thiophene.
- Relative aromaticity and reactivity of Pyrrole, Furan and Thiophene.

Module 04

08 Hours

Synthesis, Reactions and Medicinal Uses of Following Compounds/Derivatives

- Pyrazole, Imidazole, Oxazole and Thiazole.
- Pyridine, Quinoline, Isoquinoline, Acridine and Indole. Basicity of pyridine.

Synthesis and Medicinal Uses of

- Pyrimidine, Purine, azepines and their derivatives.

Module 05

07 Hours

Reactions of Synthetic Importance

- Metal hydride reduction (NaBH_4 and LiAlH_4), Clemmensen reduction, Birch reduction, Wolff Kishner reduction.
- Oppenauer-oxidation and Dakin reaction.
- Beckmanns rearrangement and Schmidt rearrangement. Claisen-Schmidt condensation.

Recommended Books (Latest Editions)

1. Organic chemistry by I.L. Finar, Volume-I and II.
2. A textbook of organic chemistry – Arun Bahl, B.S. Bahl.
3. Heterocyclic Chemistry by Raj K. Bansal.
4. Organic Chemistry by Morrison and Boyd.
5. Heterocyclic Chemistry by T.L. Gilchrist.