Course Title **:**DSC-GENERAL ORGANIC CHEMISTRY, ***w.e.f. the session 2025-26 and onwards***	
Class B.Sc : PT.IV / SEM VII	COURSE CODE : BCH-C 702
Lecture:60	Credits: 04
MM: 70	Exam Hr : 03

NOTE: The question paper shall consist of Two sections (Sec.-A and Sec.-B). Sec.-A shall contain 10 short answer (about 150 words) type questions of SIX marks each and student shall be required to attempt any five questions. Sec.-B shall contain 08 descriptive type questions of TEN marks each and student shall be required to attempt any four questions. Both sections shall have questions from the entire syllabus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

Course Contents:

Organic Reaction Mechanism:

(a) Substitution or Displacement Reactions: Nucleophilic and electrophilic substitutions with mechansim (S_N and S_E), Frie's rearrangement, Friedeal-Craft reactions, Reimer-Tiemann reaction, Chichibabin reaction.

(b) Addition Reactions: Electrophilic and nucleophilic additions with mechanism, hydroboration, Michael addition, sharpless asymmetric epoxidation; aldol, Perkin, Stobbe condensations, Cannizaro reaction, Wittig reaction. (10 Lectures)

Reaction Intermediates: Carbocations, carbanions, free radicals, nitrines and benzyne, their formation, stability, detection and reactions.

Molecular rearrangements: Involving electron deficient carbon, nitrogen and oxygen viz- Pinacol-pinacolone, Wagner-Meerwein, Beckmann, Hofman, Lossen, Curtius, Schmidt rearrangements, Bayer-Villiger oxidation of ketones. Favorskii, Demjanov rearrangements. (10 Lectures)

Reagents in organic synthesis: Useof the following reagents in organic synthesis: Gilman's reagents, lithium diisopropyl amide (LDA), 1,3-dithiane, osmium tetroxide, selenium dioxide.

Heterocyclic Compounds: Aromaticity, synthetic methods and reactions of indole, quinoline and isoquinoline with special reference to Fisher indole synthesis, Skraup synthesis and Bischler-Napieralski synthesis. (10 Lectures)

Pericyclic reactions: Classification of Pericyclic reactions**,** Selection rules and stereochemistry of electrocyclic reactions, cycloaddition and sigmatropic shifts. Sommelet-Hauser, Cope and Claisen rearrangements, ene reaction.

Photochemical reactions: Cis-trans isomerization, Paterno-Buchi reaction, Norrish type I and II reactions of α, β unsaturated ketones, photo reduction of ketones, di-pimethane rearrangement, photochemistry of arenes. (10 Lectures)

Stereoisomerism: Optical activity and Optical isomerism, Racemic mixture, Resolution, R-S nomenclature. Geometrical isomerism in the compounds containing C = C and C = N bonds, elementary idea of geometrical isomerism in cyclic compounds. E-Z nomenclature.

Stereochemistry: Asymmetric induction, prochiral relationships, stereoselective and stereospecific reactions and their use in reaction mechanism, Stereochemistry of substituted cycloalkanes. (10 Lectures)

Suggested Readings:

1. Organic Chemistry by: Boyd and Morrison
2. Organic Chemistry by: I.L.Finar
3. Organic Chemistry by: Kapoor, Singh and Mukherjee
4. Organic Chemistry by: Bruice
5. Organic Chemistry by: Pine
6. A Guide Book to Organic Reaction Mechanism by: Peter Sykes

Course Objectives

1. To understand the basics of organic reaction mechanism.
2. To learn about photochemical and pericyclic reactions and various reagents for synthesis.
3. To understand the concept and application of stereochemistry.

Course Outcomes (Cos)

After the completion of this course, a student should be able to:

CO:1 Understand the basics of organic reaction mechanism.

CO:2 Apply the organic name reactions important in chemical industries like aldol reaction, Michael addition, hydroboration etc.

CO:3 Understand the reaction intermediate and all types of molecular rearrangement.

CO:4 Have a basic understanding of use of reagent in organic synthesis like LDA, Gillman reagent etc.

CO:5 Understand the mechanism and application of pericyclic and photochemical reactions.

CO:6 Have understanding of industrial synthesis of representative heterocyclic compounds applicable in various fields of pharmaceutical drugs.

CO:7 Understand the stereochemical aspect of organic molecules asymmetric induction and stereospecific reactions.

Course Outcomes (Cos) / Program Outcomes (Pos)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
CO:1	×	×						
CO:2		×						×
CO:3		×						
CO:4	×	×						×
CO:5	×	×						
CO:6		×		×				×
CO:7		×						

Note: put ‘X’in relevant column of the mapping