

Department of Applied Chemistry

Course completion unit plan

CH-91205

(ORGANIC CHEMISTRY)

Academic Year 2023-24

Lecture duration = 1 hour

Lecture No.	Date	Topic to be taught	Reference/ Remark
Unit 1: Stereochemistry & Conformational Analysis			
1		General introduction of isomers and isomerism , Conformational and Configurational isomers. Geometrical isomerism and stereoisomerism (optical isomerism)	Eliel E.L., Stereo chemistry of Carbon Compounds (Mc Graw Hill.)& P.S. Kalsi
2		Various techniques of molecular representation in organic molecules and their inter-conversion.	-
3		Nomenclature of organic molecule- R/S nomenclature , E/Z nomenclature with examples.	-
4.		Concept of chirality, chiral carbon , optical activity of organic compound , Isomers relations- Enantiomers, Diastereomers, Homoisoimers .	-
5.		Optical activity & isomerism in diphenyles , nomenclature in diphenyles.	-
6.		Optical activity and isomerism in spirals compounds and Allenes.	-
7.		Conformations of ethane and butane with energy profile diagram.	-
8		Conformations of cyclopentane and cyclohexane with energy profile diagram.	-
Unit 2: Reaction mechanism , Intermediates & Molecular rearrangements.			
9		Chemical reactions , Substitution reactions , Addition reactions , Elimination reactions	March J, Structure Reactions and Mechanism. (John Wiley & Sons,New York)

10		Types of mechanism in nucleophilic substitution reaction –Unimolecular, Bimolecular , Intramolecular reaction and Factors affecting on it.	-
11		Types of mechanism elimination reaction – Unimolecular, Bimolecular , conjugated base reaction and Factors affecting on it.	-
12		Types of mechanism in addition reaction, Methods of determining the mechanism of reaction.	-
13		Formation of intermediates in chemical Reaction – Carbocation , Carbanion, Free radical , Carbene and Nitrene	-
14		Pinacol- Pinacolone rearrangement , Beckmann rearrangement, Lossen rearrangement.	-
15		Schmidt , Hofmann, Curtius , Baeyer-Villiger rearrangement.	-
16		Favrouskii & Wittig rearrangement, Walden inversion.	-
Unit 3: Disconnection Approach			
17		An introduction of synthesis and synthetic equivalents.	Clyden and Greeves, Organic chemistry, Oxford university press
18		Disconnection Approach or Retro-synthetic analysis with examples	-
19		Functional group interconversion , The importance of the order of events in organic synthesis.	-
20		One group C-X disconnection with examples	-
21		Two group C-X disconnection : Diels - Alder reaction , Stereospecificity, Stereoselectivity and Endo selectivity.	-
22		Concept of reversal of polarity : Umpolung polarity .	-
23		Methods of protection of groups in organic synthesis.	-
24		Asymmetric synthesis	-
Unit 4: Modern reagent in organic synthesis			
25		Metal Hydrides , Organic peroxides , Per-acids .	Clyden and Greeves, Organic chemistry, Oxford university press

26		Boron trifluorides , Ozone, Lead tetraacetate, Selenium dioxide ,	-
27		N-bromo succinamide , Diazomethane , Diazoacetic - ester.	-
28		Osmium tetroxide , Trifluoroacetic acid , DCC	-
29		Organometallic compounds of Aluminum(Al) and application in organic synthesis.	-
30		Organometallic compounds of Lithium (Li) and application in organic synthesis.	-
31		Organometallic compounds of Magnesium (Mg) and application in organic synthesis.	-
32		Organometallic compounds of Copper (Cu) and application in organic synthesis.	-
Unit 5: Aromaticity, Organic Photochemistry and Pericyclic reaction			
33		Concept of aromaticity, Huckel's rule for Aromaticity.	Clyden and Greeves, Organic chemistry, Oxford university press
34		Stability between Aromatic, Non-aromatic, Homo-aromatic, Anti-aromatic.	-
35		Aromaticity in Benzenoid and non benzenoid cyclic compounds.	-
36		Concept of homo - aromaticity , Quashi - aromatic compounds with examples.	-
37		Jablonski's diagram , Norris type-I and type-II reaction.	-
38		Introduction of pericyclic reactions, Molecular orbital diagram of conjugated pi systems.	-
49		Electrocyclic reaction , Cycloaddition reaction with examples.	-
40		Sigmatropic rearrangement with examples.	-