



SECOND SEMESTER 2020-2021
Course Handout Part II

Date: 16-01-2021

In addition to part-I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No. : **CHEM F243**
Course Title : **Organic Chemistry-II**
Instructor-in-Charge : **Tanmay Chatterjee**
Instructor : **Anupam Bhattacharya**

Scope and Objective of the Course: Stereochemistry is highly important to the most of the life-saving drugs, many materials that cater our essential needs. Hence this course is to familiarize the students with stereochemical concepts and their applications in organic synthesis; important functional group transformations; and pericyclic reactions. Emphasis will be placed not only on the mechanistic and stereoelectronic features but also on the way in which they are utilized in target synthesis.

Textbooks:

1. E. L. Eliel, S. H. Wilen & L. N. Mander, Stereochemistry of Organic Compounds, John Wiley & Sons, 1st Ed., 2004. **(T1)**
2. Michael B. Smith & Jerry March, Advanced Organic Chemistry, John Wiley & Sons, 6th ed., 2012. **(T2)**

Reference books:

1. J. Clayden, N. Greeves, S. Warren, P. Wothers, Organic Chemistry, OUP, 1st ed., 2000. **(R1)**
2. R. T. Morrison, R. Boyd and S. K. Bhattacharjee, Organic Chemistry, 7th ed. **(R2)**
3. Subrata Sengupta, Basic Stereochemistry of organic molecules, Oxford University press **(R3)**

Course Plan:

Lecture No.	Learning objectives	Topics to be covered	Chapter in the Text Book
1-2	Nature of stereoisomers,	Introduction to stereoisomers; identifying enantiomers and	T1: Ch. 3, pg. 49-69.



	Enantiomers and Diastereomers	diastereomers; also to understand their difference	
3-5	Symmetry elements, symmetry operators, symmetry and molecular properties.	Introduction to symmetry elements; to identify symmetry elements in molecules; associate molecules with symmetry point groups.	T1: Ch. 4, pg. 71-87, 92-97
6-8	Relative and absolute configuration, relative configuration and notation, determination of relative configuration	What is meant by relative and absolute configuration? How relative configuration is determined? Rules governing R/S nomenclature (absolute configuration).	T1: Ch. 5, pg. 101-112, 117-123, 126-128, 130-144
9-10	Introduction, nomenclature, allenes	Chirality in molecules devoid of chiral centers – 1. Why these molecules are considered as chiral? Important examples and their applications.	T1: Ch. 14, pg. 1119-24, 1132
11-13	Alkylidenecycloalkanes, Spiranes, Biphenyl atropisomerism, Molecules with planar chirality	Chirality in molecules devoid of chiral centers -2. Why these molecules are considered as chiral? Important examples and their applications.	T1: Ch. 14, pg. 1133-50, 1166-76
14-15	<i>cis-trans</i> isomerism, determination of configuration of <i>cis-trans</i> isomers by chemical & physical methods	Stereochemistry of alkenes; E-Z nomenclature of alkenes; methods for the determination of configuration.	T1: Ch. 9, pg. 539-574
16-17	Conformation of unsaturated acyclic and miscellaneous molecules	What is conformation of a molecule? Importance and important examples. Conformation of acyclic molecules; identifying stable and unstable conformations. What are the various interactions leading to	T1: Ch. 10, pg. 597-627

		stable/unstable conformations?	
18-19	Conformational aspects of the chemistry of six membered ring compounds	Understanding the conformations of cyclic molecules; identifying stable and unstable conformations. What are the various interactions leading to stable/unstable conformations in cyclohexane?	T1: Ch. 10, pg. 665-754
20-25	Different reaction mechanisms involved in organic transformations such as SN1/SN2/SN'/S _N i, neighboring group mechanism E1, E2, E1cB, addition to C=C double bond.	Understand diverse reaction mechanism, ranging from substitution to elimination. Non-classical carbocations, reason for their stability and examples.	T2 : Ch. 10: 425-519, Ch. 17: 1477-1506, Lecture notes
26-29	Resolution and stereoselective synthesis	Asymmetric synthesis; common approaches	R1 : Ch.16, 399-404, Ch.34, 881-904, Lecture notes
30-38	Types of Pericyclic reactions (electrocyclic, cycloaddition & sigmatropic), correlation diagrams, FMO approach & PMO approach, Woodward-Hofmann rules	Pericyclic reactions; type; mechanism and applications	R2: Ch. 20 1032-1048, Lecture notes

Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time	Nature of Component
Midsem Examination	90 min	30	03.03.2021 1:30 – 3:00 pm	Open Book



Class tests*	15-20 min	30	Continuous	Open Book
Comprehensive Examination	2 hrs	40	08.05.2021 (AN)	Open book

* **4 class tests will be held before the mid-semester examination 4 after midsem; the best 6 out of 8 tests will be considered.**

Chamber Consultation Hour: To be announced in the class.

Notices: All the notices pertaining to this course will be displayed on **CMS and/or Chemistry Department Notice Board.**

Make-up Policy: Make-up(s) will be granted only for genuine reasons.

Academic Honesty and Integrity Policy: Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

INSTRUCTOR-IN-CHARGE
CHEM F243

