Birla Institute of Technology & Science, Pilani
Hyderabad Campus

SECOND SEMESTER 2019-2020

Course Handout Part II

Date: 06-01-2020

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

Course No: **CHEM F243**
Course Title: **Organic Chemistry-II**
Instructor-in-charge: **Anupam Bhattacharya**
Instructor: **Manab Chakravarty**

1. 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.

2. Text Books: E. L. Eliel, S. H. Wilen & L. N. Mander, Stereochemistry of Organic Compounds, John Wiley & Sons, 1st Ed., 2004. **(T1)**

Michael B. Smith & Jerry March, Advanced Organic Chemistry, John Wiley & Sons, 6th ed., 2012. **(T2)**

Reference Books:

J. Clayden, N. Greeves, S. Warren, P. Wothers, Organic Chemistry, OUP, 1st ed., 2000. **(R1)**

R. T. Morrison, R. Boyd and S. K. Bhattacharjee, Organic Chemistry, 7th ed. **(R2)**

Subrata Sengupta, Basic Stereochemistry of organic molecules, Oxford University press **(R3)**

3. Course Plan:

Lec. No.	Topics to be Covered	Learning objectives	Chapter in the Text Book
1-2	Nature of stereoisomers, Enantiomers and Diastereomers	Introduction to stereoisomers; identifying enantiomers and diastereomers; also to understand their difference	**T1**: Ch. 3, pg. 49-69.
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, Spriranes, Biphenyl atropisomersism, 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	*cis-trans* isomerism, determination of configuration of *cis-trans*	Stereochemistry of alkenes; E-Z nomenclature of alkenes; methods for the determination of configuration.	**T1**: Ch. 9, pg. 539-574

	isomers by chemical & physical methods		
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 stable/unstable conformations?	**T1**: Ch. 10, pg. 597-627
18-20	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
21-26	Different reaction mechanisms involved in organic transformations such as SN1/SN2/SN'/SNi, 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
27-31	Resolution and stereoselective synthesis	Asymmetric synthesis; common approaches	**R1** : Ch.16, 399-404, Ch.34, 881-904, Lecture notes
32-41	Types of Pericyclic reactions (electrocyclic, cycloaddition & sigmatropic), correlation diagrams, FMO approach & PMO approach,	Pericyclic reactions; type; mechanism and applications	**R2**: Ch. 20 1032-1048, Lecture notes

	Woodward-Hofmann rules		

4. Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time	Nature of Component
Midsem Examination	90 min	30	6/3 11.00 -12.30 PM	**Closed Book**
Class tests*	15 min	20	Continuous	**Closed Book**
Assignment/HW/Seminar	-	10	Continuous	**Open book**
Comprehensive Examination	3 hrs	40	12/05 AN	**30% Closed book + 10% Open book**

***There will be 4 class test before mid-semester examination and 4 class test after mid-semester examination. Best of 3 test will be considered for each half (pre and post mid-semester exam).**

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

6. Chamber consultation hours: To be announced in the class.

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

8. **Course Policies:**

(a) **Absences:** Students are responsible for all materials presented in the course as well as for acquiring missed information.

(b) **Electronic Devices: Cell phones must be turned off in class.** All electronic devices must be off during class or exams. This includes laptop computers as well as programmable calculators. You will be allowed only a simple scientific calculator for exams (if required).

9. 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