

BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI - HYDERABAD CAMPUS**First Semester 2016-17****INSTRUCTION DIVISION****Course Handout**Date: 01st Aug., 2016

Course No: CHEM F212
Course Title: **ORGANIC CHEMISTRY - I**
Instructor-in-charge: K V G CHANDRA SEKHAR

1. Scope and objective of the course: To familiarize the students with basic mechanistic aspects of organic reactions including mechanistic types, thermodynamics and kinetics, the important intermediates involved in organic reactions, functional group chemistry.

2. Text Book: T1 - R. T. Morrison, R. Boyd and S. K. Bhattacharjee, Organic Chemistry, 7th edition.

Reference Books: R1 - J. Clayden, N. Greeves, S. Warren, P. Wothers, Organic Chemistry, OUP, 1st ed., 2000.

R2 - Jerry March, Advanced Organic Chemistry, John Wiley & Sons, 4th ed., 1992.

R3 - G Marc Loudon, Organic Chemistry, Oxford, 4th Edition, 2002.

R4 - Francis A Carey, Organic Chemistry, Tata McGrawHill, 7th edition, 2008.

3. Course Plan:

Lec. No.	Learning objectives	Topics to be covered	Text book , Chapter, Page no.
1-2	Basic terminology and representation of organic reactions	Homolytic, heterolytic fission of bonds, concept of electrophiles and nucleophiles; how to write organic reaction mechanisms; movement of arrows; curved and fish-hook arrows; examples	T1: Ch. 4, pg. 55-59. R1: Ch. 5, pg. 116-131.
3-4	Reactive intermediates: carbocations	Carbocations: Structure & stability, generation and reactions	T1: Ch. 4, pg. 64-69.
5	Reactive intermediates: carbanions	Carbanions: Structure & stability, generation and reactions	T1: Ch. 4, pg. 69-72.
6	Reactive intermediates: free radicals	Free radicals: Structure & stability, generation and reactions	T1: Ch. 4, pg. 81-86.
7-8	Reactive intermediates: others	Carbenes; nitrenes: generation, stability, and fate	T1: Ch. 4, pg. 72-78.
9-14	Aromatic chemistry	Aromatic nucleophilic substitutions; Aromatic electrophilic substitutions; S _N Ar mechanism; benzyne mechanism;	T1: Ch. 5C, pg. 262-283; Ch. 9, pg. 488-502. R1: Ch. 23, pg. 589-604.
15-18	Alkyl and aryl halides	Synthesis and reactions of alkyl and aryl halides	T1: Ch. 8, pg. 426-462. Ch. 9, pg. 482-485.
19-23	Alcohols, phenol and ethers	Synthesis, reactivity; applications of Grignard reagents for synthesis; diols, acid/base catalysed ring opening	T1: Ch. 10, pg. 507-537. Ch. 11, pg. 545-562. Lecture notes (epoxides)
24-26	Amines and nitro compounds	Synthesis, basicity and reactions	T1: Ch. 15, pg. 696-736. and Lecture Notes (Nitro compounds)
27-33	Carbonyl compounds	Synthesis, reactivity, enolates, malonate and ethyl acetoacetate synthesis Aldol, Crossed Aldol and Claisen	T1: Ch. 12, pg. 571-611. R1: Ch. 21, pg. 524-541. Lecture notes

		condensation; Conjugate addition reactions of α , β -unsaturated carbonyl compounds with special reference to Michael addition, Mannich reaction, Wittig reaction	(malonate & ethyl acetoacetate)
34-36	Carboxylic acid & derivatives	Synthesis, reactions, conversion for acid to other derivatives	T1: Ch. 13, pg. 624-648; Ch. 14, Pg. 657-685
37-38	Carbohydrates	Introduction and their reactions	T1: Ch. 26, pg. 1228-1236, 1244-1253.
39-42	Thermodynamics and kinetics aspects of organic reactions	Thermodynamic and kinetic control; Hammond postulate; methods to determine mechanisms (Hammett equation, kinetic isotopic effect); examples	T1: Ch. 4, pg. 97-102. R1: Ch. 13, pg.319-330. Ch. 22, pg. 554-556. Ch. 41, pg.1090-1101. R2: Ch. 6, pg. 208-215, 217-219, 226.

4. Evaluation:

Component	Duration	Weightage (%)	Date and Time	Remarks
Test 1	60 min.	20	9/9, 1.00--2.00 PM	Closed Book
Test 2	60 min.	20	24/10, 1.00--2.00 PM	Closed Book
Surprise tests*	10 min.	20	Continuous	Closed Book
Comprehensive Examination	3 hr	20(CB)+20(OB)	05/12 AN	Partially Open Book

* 12 surprise tests will be conducted and best 10 will be considered.

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

6. Chamber consultation hours: To be announced

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

**Instructor-in-Charge
Organic Chemistry - I**