

BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI - PILANI CAMPUS
INSTRUCTION DIVISION, SECOND SEMESTER 2015-2016

Course Handout

Date: 11/01/2016

Course No.: **CHEM F342**
Course Title: **Organic chemistry-IV**
Instructor-in-charge: **Paritosh Shukla**
Instructors: **Rajeev Sakhuja**

1. Course Description: The course aims at covering topics in synthesis and reaction of various heterocyclic compounds, natural products and biomolecules. Structure, nomenclature, and common reactions of heterocyclic compounds; synthesis, properties, and reactions of three-, four-, five-, and six-membered ring systems; condensed five- and six-membered ring systems; introduction to natural products; terpenoids, steroids, lipids, alkaloids, amino acids, peptides, proteins, and vitamins.

2. Text Books:

TB1. Raj K Bansal, heterocyclic Chemistry, fifth edition (TB), New Age International publishers

TB2. I. L. Finar, Organic chemistry Vol. 2, 5th Ed.; Pearson

3. Reference Books:

R1. J. Clayden, N. Greeves, S. Warren, P. Wothers, Organic Chemistry, Oxford University Press

R2. R. T. Morrison, R. Boyd, and S. K. Bhattacharjee, Organic Chemistry, 7th edition.

4. Learning Outcomes: At the end of the course, the student should be able to:

- Name simple three-, four-, five-, and six-membered heterocycles
- Devise synthesis of the aforementioned systems
- Solve simple synthetic problems based on the above systems
- Recognize five important biological products and state why they are important
- Design simple synthesis and solve reaction related problems of the natural products discussed in the class

5. Course Plan:

Lec. No.	Topic	Learning Objective	Reference to text books
1-2	Introduction and Nomenclature of few Heterocyclic compounds	How to name the three-, four-, five, and six-membered heterocyclic ring systems following IUPAC.	TB1: Chapter 1 Class notes
3-5	Three-membered heterocycles	Selective synthesis and reactions of Aziridines, Oxirane, Thiiranes	TB1: Chapter 2 Refer class notes
6	Introduction to natural products	Classification of natural products and their importance	General: Class notes
7-9	Triterpenoids	Classification, chemistry, etc	TB2: Chapter VIII
10-12	Steroids	Classification, chemistry, etc	TB2: Chapter XI
13-16	Four-membered heterocycles	Selective synthesis and reactions of Azetidines, Oxetane, Thietane	TB1: Chapter 4 Refer class notes
17-20	Five-membered heterocycles	Selective synthesis and reactions of Pyrroles, Furan and thiophenes	TB1: Chapter 5 R1: Chapter 43
21-23	Six-membered heterocycles	Selective synthesis and reactions of Pyridines	TB1: Chapter 6 R1: Chapter 43
24-28	Benzo-fused heterocycles	Selective synthesis and reactions of quinoline, isoquinoline and indoles	TB1: Chapter 7, 8 R1: Chapter 43

29-30	Lipids	Classification, chemistry, etc	R2: Chapter 25, See class notes for details
31-34	Alkaloids	Classification, chemistry, etc	TB2: Chapter XIV
35-38	Amino acid & Peptides, Proteins	Classification, chemistry, etc.	TB2: Chapter XIII
39-41	Vitamins	Classification, chemistry, etc.	TB2: Chapter XVII

6. Evaluation Scheme:

Component	Weightage% (Marks 200)	Date /Time/Venue
Mid-term Exam.	25 (Closed Book, 50 M)	17/3 2:00 -3:30 PM
Comprehensive Exam.	45 (Closed + Open Book, 90 M)	11/5 FN
Quiz/Assignment	30 (closed, 60 M)	Continuous

7. Chamber Consultation Hour: To be announced in the class.

8. Notices: Notices concerning the course will be displayed on Chemistry Group notice board only.

Instructor-in-Charge
CHEM F342