

INSTITUTE	FACULTY OF SCIENCE
PROGRAM	BACHELOR OF SCIENCE (CHEMISTRY)
SEMESTER	5
COURSE TITLE	ORGANIC CHEMISTRY
COURSE CODE	02CY0302
COURSE CREDITS	6

Course Outcomes: After completion of this course, student will be able to:

- 1 Understand the basics of stereochemistry.
- 2 Be aware of the basics of conformations and configuration.
- 3 Obtain the information regarding alkaloids and terpenoids.
- 4 Understand the basic of drugs and dyes.

Pre-requisite of course: Understand essential concepts in organic chemistry.

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
5	0	2	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	Stereochemistry Stereochemistry, Isomersim, stereoisomerism, plane polarized light, polarimeter, specific rotation, enantiomers, diastereomers, metamerism, chiral molecules and chiral centre, molecules with one chiral centre and more than one chiral centre, prostereoisomerism, resolution, racemisation, optical purity, absolute configuration, R & S sequence rule.	20
2	Conformation and configuration Conformation and free rotation, conformational analysis of ethane, n-butane, cyclohexane and cyclopentane, Baeyer's strain theory, Sacke-Mohr theory, conformation of cyclohexane, mono substituted cyclohexane and disubstituted cyclohexane.	15
3	Alkaloids and Terpenoids Introduction, occurrence, classification, isolation, general methods of proving structure of alkaloids, constitution, properties and synthesis of conine, nicotine and papavarine. Introduction, occurrence, isolation, general properties of terpenoids, isoprene rule, synthesis of citral.	15

Contents : Unit	Topics	Contact Hours
4	Drugs and Dyes Drugs: Introduction to drugs, classification of drugs, synthesis and application of ibuprofen, atenolol and adrenaline. Dyes: Introduction, classification by structure and methods of application, synthesis and uses of methyl orange, congo red, malachite green, alizarin and indigo.	10
Total Hours		60

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	Experiments Experiment-1, Experiment-2, Experiment-3, Experiment-4, Experiment-5, Experiment-6, Experiment-7, Experiment-8	
Total Hours		

References:

- 1 Organic Reactions and their Mechanisms; P. S. Kalsi, New Age International Publishers.
- 2 Organic Chemistry; R. T. Morrison and R. N. Boyd, 6th Edition, Prentice Hall of India.
- 3 Organic Chemistry; Morrison and Boyd
- 4 Organic Chemistry (Volume I, II & III); S. M. Mukherji, S. P. Singh, R. P. Kapoor.

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking
10.00	20.00	25.00	25.00	10.00	10.00

Instructional Method:

- 1 The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.
- 2 The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.
- 3 Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.
- 4 Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory

Instructional Method:

- 5 Use of hazardous/toxic chemicals should be avoided as far as possible in laboratory.
- 6 All students in the laboratory must wear safety goggles and lab coats during lab session.

Supplementary Resources:

- 1 <https://ocw.mit.edu/courses/chemistry/>
- 2 <http://vlab.amrita.edu/index.php?sub=2>
- 3 <https://www.youtube.com/playlist?list=PL166048DD75B05C0D>
- 4 https://www.youtube.com/watch?v=qiKJqdJK_t8
- 5 <https://www.wiley.com/en-aw/The+Organic+Chemistry+of+Drug+Synthesis%2C+Volume+7-p-9780470107508>
- 6 <https://www.youtube.com/watch?v=eGvL5l6AnxI>