INSTITUTE	**FACULTY OF SCIENCE**
PROGRAM	**BACHELOR OF SCIENCE (CHEMISTRY)**
SEMESTER	**5**
COURSE TITLE	**ORGANIC CHEMISTRY**
COURSE CODE	**02CY0306**
COURSE CREDITS	**4**

Objective:

1 To study the concept stereochemistry.
2 To make students capable of understanding the basics of conformation and configuration.
3 To study the introduction, properties, occurrence of alkaloids and terpenoids.
4 To know more about drugs and dyes.

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
4	0	0	50	30	20	0	0

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, Sache-Mohr theory, conformation of cyclohexane, mono substituted cyclohexane and disubstituted cyclohexane.	15

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Contents : Unit	Topics	Contact Hours
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
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**

Textbook :

1 The text book of stereochemistry, Er. Nirpesh Vikram, Pragati Prakashan, 2019
2 Textbook of Stereochemistry, Conformation, Analysis and Mechanism, Sushil Chauhan, Campus Books International, 2015
3 Alkaloids And Terpenoids, Fritz Helmet , Ivy Publishing House, 2008
4 Introduction to synthetic drugs and dyes, Bholanath Mukherjee, Himalaya Publishing, 2010

References:

1 Stereochemistry of Organic Compounds, Stereochemistry of Organic Compounds, Samuel H. Wilen, Ernest L. Eliel , Wiley , 1994
2 Stereochemistry: Conformation and Mechanism, Stereochemistry: Conformation and Mechanism, P.S. Kalsi , New Age International Private Limited, 2022
3 Chemistry of Natural Products: Alkaloids and Terpenoids, Chemistry of Natural Products: Alkaloids and Terpenoids, Ayodhya Singh, Campus Books International, 2004
4 Alkaloids: Chemistry, Biology, Ecology, and Applications, Alkaloids: Chemistry, Biology, Ecology, and Applications, Tadeusz Aniszewski, Elsevier , 2015
5 Dyes and Drugs, Dyes and Drugs, Harold H. Trimm, William Hunter Jr.,, Apple Academic Press, 2011

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 / Creative
10.00	20.00	30.00	30.00	10.00	0.00

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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 evaluationde will be done on the basis of continuous evaluation of stunts 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, ecourses, Virtual Laboratory
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

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