

Branch Name:	M.Sc. Chemistry
Program Code:	SC203
Course Name:	Natural Products
Course Code:	2SC2030102
Pre-requisite Course:	Basic organic chemistry up to B.Sc.

Course Objectives:

- To provide fundamental knowledge of the classification, structure, chemistry, and biosynthesis of terpenoids and flavonoids.
- To develop an understanding of the classification, biogenesis, structural elucidation, and chemical properties of important alkaloids.
- To explain the chemistry, structural features, and biological significance of carotenoids and fat- and water-soluble vitamins.
- To introduce the chemical nature, classification, and biological roles of hormones and their relationship with vitamins in biochemical processes.

Teaching and Examination Scheme:

Teaching Scheme(Hours per week)					Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit		Theory (Marks)		Practical (Marks)		Total (Marks)
			T	P	University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
4	-	-	4	-	50	50	-	-	100

Subject Contents:

Unit	Contents	Lecture	Weightage
1	Terpenoids and flavonoids Introduction, Classification, Chemistry of Abietic Acid, Squalene, Phytol, Cadinene, Zingiberene. Introduction to flavonoids, classification, Biosynthesis study of anthocynins, flavanols, flavones and isoflavones.	12	25%
2	Alkaloids Classification of alkaloids, General biogenetic study of alkaloids, Chemistry and Structure elucidation of Papavarine, Reserpine, Conine, Narcotine, Strychnine and Colchicine.	12	25%
3	Carotenoids Introduction, carotenes, β -carotene, α -carotene, lycopene, γ -carotene, vitamin A, xanthophylls, Carotenoidacids.	12	25%
4	Vitamins and hormones Detailed Study of Chemistry of Vitamin A, Thiamine (Vitamin-B1), Pantothenic Acid (Vitamin-B2), Pyridoxine-(Vitamin-B6), Ascorbic Acid (Vitamin-C) and Biological importance of Vitamins Introduction of Hormones, Types of Hormones: Classification based on chemical structure (steroid hormones, peptide hormones, and amino acid-derived hormones)	12	25%

Text Books:

1. Organic Chemistry Natural Products vol.1 and 2 by O.P. Agarwal, Krishna Publication house.

Reference Books:

1. Chemistry of Natural Products by Sujata V. Bhat, Bhimsen A. Nagasampagi, Meenakshi Sivakumar published by Springer Nature.
2. Organic Chemistry: Stereochemistry and the Chemistry of Natural Products v. 2 by I. L. Finar published by Pearson

List of Open Source Software/learning website:

1. https://onlinecourses.nptel.ac.in/noc25_ch102

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Explain the classification, structure, and chemistry of terpenoids and flavonoids.	2. Understanding
CLO2	Describe the biosynthesis of flavonoids and the biogenetic pathways of alkaloids.	2. Understanding
CLO3	Analyze the structure and methods of structural elucidation of important alkaloids.	4. Analyzing
CLO4	Illustrate the chemistry and biological significance of carotenoids and vitamins.	3. Applying
CLO5	Classify hormones based on chemical structure and relate their functions to biological systems.	2. Understanding

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)																PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	1	2
CLO1	2	2									1						3	
CLO2	2	3								1	1						2	2
CLO3	3	3	2	1							1						1	1
CLO4	2	2	2	1	1						1						3	2
CLO5	2	2		2	1					1	1						2	3

3:High, 2:Medium, 1:Low