GAYATRI VIDYA PARISHAD
COLLEGE FOR DEGREE AND PG COURSES (AUTONOMOUS)
Affiliated to Andhra University | | Accredited by NAAC and NBA
VISAKHAPATNAM

DEPARTMENT OF ORGANIC CHEMISTRY

M.Sc. (Final) CHEMISTRY SYLLABUS
SEMESTER-III
PAPER-IV-CHEMISTRY OF NATURAL PRODUCTS
(Effective from the admitted batch of 2022-2023)

Credits: 4		**Theory: 4 Hours**
Max Marks: 100	**External: 80**	**Internal: 20**

Course Outcomes (COs)/Course Specific Outcomes (CSOs):

CO 1: Acquire the knowledge of isolation, structural elucidation, stereochemistry, synthesis and biological properties of selected antibiotics, Acetogenins and shikimates

CO 2: Acquire the knowledge of isolation, structural elucidation, stereochemistry, synthesis and biological properties of selected terpenes

CO 3: Acquire the knowledge of isolation, structural elucidation, stereochemistry, synthesis and biological properties of selected steroids.

CO 4: Acquire the knowledge of isolation, structural elucidation, stereochemistry, synthesis and biological properties of selected alkaloids

CO 5: Acquire the knowledge of isolation, structural elucidation, stereochemistry, synthesis and biological properties of amino acids, proteins and nucleic acids

Course learning outcome (LOs):

Upon completion of the course the students should be able to:

LO 1: Explain the isolation, structural elucidation, stereochemistry, synthesis and biological properties of selected antibiotics, Acetogenins and shikimates

LO 2: Apply the knowledge of isolation, structural elucidation, stereochemistry, synthesis and biological properties of selected terpenes

LO 3: Develop the interest in isolation, structural elucidation, stereochemistry, synthesis and biological properties of selected steroids.

LO 4: Develop the interest in isolation, structural elucidation, stereochemistry, synthesis and biological properties of selected alkaloids

LO 5: Explain the isolation, structural elucidation, stereochemistry, synthesis and biological properties of amino acids, proteins and nucleic acids

LO 6: apply the knowledge of structure, isolation and synthesis of various natural products to develop new derivatives.

UNIT-I: [12 Hours]

A) Antibiotics : Isolation, structure elucidation, stereochemistry, synthesis and biological properties of Penicillin G, Cephalosporin-C.

B) **Acetogenins and shikimates:** Prostaglandin 15 R PGA_2 - podophyllotoxin - etoposide

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UNIT-II:

Terpenes **[12 Hours]**

Isolation, structure elucidation, stereochemistry, synthesis and biological properties of Terpenes: Forskolin, Taxol and azadirachtin.

UNIT-III: **[12 Hours]**

Steroids: Isolation, structure elucidation, stereochemistry, synthesis and biological properties of Steroids: Cholesterol - progesterone - β-amyrin

UNIT-IV:

Alkaloids **[12 Hours]**

Isolation, structure elucidation, stereochemistry, synthesis, and biological properties of Alkaloids: Morphine, camptothecin and Vincristine

UNIT-V: **[12 Hours]**

A) Peptides and Proteins: α-Aminoacids, their general properties and synthesis, Synthesis of peptides by Merrifield solid phase synthesis. Primary, secondary and tertiary structures of proteins

B) Nucleic acids: Heterocyclic bases; Purines: Adenine and Guanine; Pyramidines: Cytosine, Uracil and Thymine; nucleosides, nucleotides Basic concepts of the structures of RNA and DNA

Text Books:

1. Organic Chemistry, Volume 2, Stereochemistry and chemistry of natural products, I.L. Finar, 5th Edition. ELBS.
2. Chemical A spects of Biosynthesis, John Mann, Oxford University Press, Oxford,1996
3. Chemistry of Natural Products. A Unified Approach, N.R. Krishnaswamy, University Press (India) Ltd., Orient Longman Limited, Hyderabad, 1999.
4. Chemistry of Natural Products, S. V. Bhat, Narosa Publishing House, 6th reprint 2010.

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