

VEER NARMAD SOUTH GUJARAT UNIVERSITY
M.Sc. Semester-III (ORGANIC CHEMISTRY)
SYLLABUS TO BE EFFECTIVE FROM JUNE 2019

PAPER-I (Natural Products and Bio-molecules)

Max. Marks: 100 (External - 70 + Internal - 30)

Total Periods: 45

UNIT-I NATURAL PIGMENTS & ALKALOIDS (12 Periods)

(A) Natural Pigments & Porphyrins Derivatives

Porphyryns: General structures, Synthesis and Spectral properties. Synthesis of cryptopyrrole, Phytopyrrole, Opsopyrrole and Haemopyrrole and their carboxylic acid derivatives.

Structural elucidation of Haemoglobin and Chlorophyll (Analytical evidences only)

(B) Alkaloids

Classification of alkaloids; Structural elucidation of Morphine, Reserpine and Colchicine (Analytical evidences only)

UNIT-II STEROIDS & SEX HORMONES (11 Periods)

(A) Steroids

Introduction to Sterols: Structure determination of cholesterol and ergosterol (no synthesis), Bile acids: Introduction, Structural elucidation and Synthesis of Cholic acids (α and β both).

(B) Sex Hormones

Classification of hormones: Structure and synthesis of Androgens, Oestrogens and Gestrogens. Name and structures of Adrenocortical hormones, Partial synthesis of cortisone.

UNIT-III VITAMINS & TERPENOIDS (11 Periods)

(A) Vitamins

Structure determination, Synthesis and biochemical functions of Vitamin A, Vitamins B1 and B2, Vitamin H

(B) Terpenoids

Classification, nomenclature and isolation

Structure determination and synthesis of Farnesol, Zingiberene, Cadinene, Giberlic acid and Abietic acid.

UNIT-IV Nucleic Acids & Enzymes (11 Periods)

(A) Nucleic Acids

Purine and pyrimidine bases of nucleic acids, base pairing via H-bonding, Chemical and enzymatic hydrolysis of nucleic acids, Structure of nucleosides and nucleotides, DNA, RNA (Basics structures only), DNA replication, Transcription, Translation, Protein Biosynthesis.

(B) Enzymes

Classification, nomenclature and inhibition, factors affecting catalytic activity and specificity in action, regulation of enzyme activity

Reference Books Recommended:

1. Organic Chemistry, Vol. I & II (Sixth edition), I. L. Finar.
2. S.W. Pelletier, Chemistry of the Alkaloids, Van Nostrand Reinhold Co., New York (1970).
3. K.W. Bentley, The Alkaloids, Vol. I., Interscience Publishers, New York (1957).
4. Chemistry of Organic Natural Products, Vol. I & II, O. P. Agrawal.
5. Organic Chemistry of Natural Products, Vol. I & II, Chatwal.
6. Organic Chemistry (5/e) by Morrison & Boyd.
7. Chemistry of Vitamins – S. F. Dyke.
8. Natural Products Chemistry, Vol. I & II, K. Nakanishi.
9. The Molecules of Nature, J. B. Hendrickson.
10. Selected Organic Synthesis: Ian Fleming.
11. Chemistry of Natural Products, N. R. Krishnaswamy.
12. The Chemistry of Natural Products, K. W. Bentley. Vol. I – V.
13. J.W. Apsimon, Total Synthesis of Natural Products, Vol. 1-6, Wiley-Interscience Publications, New York (Vol. 1, 1973).
14. Principles of biochemistry – Donald J. Voet, Judith G. Voet, Charlotte W. Pratt (John Wiley and sons)
15. Lehninger principles of biochemistry- David L. Nelson and Michael M. Cox (Palgrave Macmillan / W. H. Freeman Company New York)
16. Biochemistry – U. Satyanarayana Baro and Allied P. Ltd., Kolkata