

Course Title: Natural Products

Semester: VIII

Course Code: CH-475

Credit Hours: 3-0

Prerequisite: Nil

### Course Objectives

1. Students will acquire knowledge about different types of natural products with emphasis on their structure, synthesis and applications.

### Course Contents

2. Alkaloids. Introduction, classification, isolation methods, structure elucidation of alkaloids, further structure, synthesis and biosynthesis of typical alkaloids such as ephedrine, nicotine, atropine, quinine, papaverine and morphine.

3. Terpenoids. Introduction, classification, isolation techniques and discussion with particular reference to structure and synthesis and biosynthesis of typical terpenoids such as citral,  $\alpha$  terpineol,  $\alpha$  pinene, camphor and  $\alpha$ -cadinene.

4. Steroids. Study of cholesterol and steroidal hormones with emphasis on their structure and biosynthesis.

5. Flavonoids. Introduction and classification of flavonoids, general biosynthetic pathway, synthesis of flavone, flavonol and cyanidin.

### Course Outcomes

6. After studying this course, students will be able to have idea about primary and secondary metabolites, biosynthesis and medicinal uses along with daily life applications.

### Text book

7. Finar, I. L., Organic Chemistry, Vol. 2, Stereochemistry and the Chemistry of Natural Products, 5th ed., Pearson Education Ltd., Delhi, (2008).

### 8. Recommended Books

a. Dewick, P. M., Medicinal Natural Products: A Biosynthetic Approach, 3<sup>rd</sup> ed., Medicinal Natural Products, John-Wiley & Sons, Ltd., (2009).

b. Sell, C. S., A Fragrant Introduction to Terpenoid Chemistry, The Royal Society of Chemistry, UK, (2003).

c. De la Rosa, L. A., Parrilla, E. A. and Aguitar, G. A. G., Fruit and Vegetable Phytochemicals: Chemistry, Nutritional Value and Stability, Wiley-Blackwell, (2009).

d. Shahidi, F. and Naczki M., Phenolics in Food and Nutraceuticals, CRC Press, (2004).

e. Oyvind, M. A., and Kenneth, R. M., Flavonoids: Chemistry, Biochemistry and Applications, CRC, Taylor & Francis, New York, (2010).

f. Hesse, M., Alkaloid Chemistry, John-Wiley & Sons, New York, (1981).70

g. Bhat, S. V., Nagasampagi, B. A. and Sivakumar, M., Chemistry of Natural Products, Narosa Publishing House, (2005).