GUJARAT TECHNOLOGICAL UNIVERSITY
M. Pharm

Phytopharmacy and Phytomedicine
SEMESTER: I

Subject Name: Natural Products Chemistry
Subject Code: MPM102T

Scope: This subject deals with the role of natural products in drugs discovery, classification of plants and biosynthetics pathways, classification of phytopharmaceuticals and an introduction to marine natural products

Objectives: Upon completion of this course the student should be able to\

1. Describe drug discovery process and role of natural products in the same.
2. Understand taxonomical classification of plants
3. Discuss various biosynthetic pathways of phytochemicals
4. Classify phytopharmaceuticals based on chemical nature
5. Describe marine natural products of various origin.
6. Discuss various excipients of herbal origin.

Sr No	Course Contents	Total Hrs
1	Drug Discovery and Development: Approaches for Drug discovery and development, Lead Identification, structure development, product development and registration process. Role of natural products in new drug development with case studies. Plant-derived drugs, novel drug templates, chemical diversity, and structure-based drug design.	10
2	Chemotaxonomy: Classification of medicinal plants, distribution of chemotaxonomical groups of constituents in plants. Phytochemical classification of plants, relationship between phytochemistry and taxonomy, variations, novel and unpredicted compounds. Biosynthetic Pathways: Importance. Important biosynthetic pathways for medicinally active phytochemicals such as alkaloids, flavonoids, saponins, steroids etc. and glyscosides thereof.	12
3	Phytopharmaceuticals: Occurrence, classification, stereochemistry, isolation and characteristic features of following. a) Carbohydrates: Mono, di, oligo- and polysaccharides b) Glycoproteins, lipoproteins and glycopeptidolipids	18

	c) saponins d) Alkaloids e) Steroids and triterpenoids f) Flavonoids, coumarins and lignans g) Lipids and autocoids	
4	Marine natural products chemistry in drug development: Chemistry and biology of marine natural products. Marine medicinals and toxins from bacteria, microalgae, rhodophyta, chlorophyta, porifera, ascidians, corals, nudibranchs. General methods of isolation and purification. Recent developments in natural product chemistry of plant and microbial sources of marine origin.	12
5.	Pharmaceutical Excipients of Herbal Origin: starch, agar, alginates, carrageenan, guar gum, acacia gum, xanthan gum, gelatin, pectin, tragacanth, numerous colouring, flavouring and sweetening agents binding agents, sustaining agents, thickening agents, gelling agents, stabilizers, and coating materials	8

REFERENCES:

1. Trease and Evans Pharmacognosy by William Charles Evans; Fifteenth Edition; W.B. Saunders Publisher; 2002.
2. Pharmacognosy & Phytochemistry of Medicinal Plants by Jean Bruneton; Second Edition; Lavoisier Publishing, NJ USA; 1999.
3. Organic Chemistry Vol2: Stereochemistry and the Chemistry of Natural Products by I.L. Finar; Fifth Edition; Pearson Education; 2006.
4. Organic Chemistry by Robert Thornton Morrison, Robert Neilson Boyd; Sixth Edition; Prentice-Hall of India Pvt. Ltd., New Delhi; 2006.
5. Medicinal Natural Products: A Biosynthetic Approach by Paul M. Dewick, 2nd Edition, John Wiley & Sons, Ltd., 2002.
6. Clarke's Isolation and Identification of Drugs: In Pharmaceuticals, Body Fluids and Post Mortem Material - E.G.C. Clarke and A.C. Moffat., 2nd Revised Edition, Pharmaceutical Press, 1986.
7. Plant Drug Analysis - Hildebert Wagner and Sabine Bladt, 2nd Edition, Springer, NY, 1996.
8. Phytochemcials as lead compound for New Drug Discovery, Chukwuebuka Egbuna, Shanshank Kumar, Elsevier, 2020.
9. Chemistry of Natural Products by S. V. Bhat, B. A. Nagasampagi, M. Sivakumar.
10. Medicinal Natural Products: A Biosynthetic Approach by Paul M. Dewick.
11. The Chemistry of Natural Products - Edited by R.H. Thomson, Springer International Edn. 1993.
12. Various recent review and research papers of relevant field.