

LJ UNIVERSITY

LJ INSTITUTE OF PHARMACY

SEMESTER: IV

Subject Name: PHARMACOGNOSY AND PHYTOCHEMISTRY II

Subject Code: BP405TP

Scope: The main purpose of subject is to impart the students the knowledge of how the secondary metabolites are produced in the crude drugs, how to isolate and identify and produce them industrially. Also this subject involves the study of different extraction and analytical techniques.

Objectives: Upon completion of the course student shall be able to

1. Acquire knowledge of modern extraction techniques, characterization and identification of the crude drugs and phytoconstituents
2. Summarize secondary metabolites containing crude drugs
3. Concepts of isolation and identification of phytoconstituents
4. Acquire knowledge about Industrial production, estimation and utilization of phytoconstituents
5. Attribute concepts of basic Biosynthetic pathways for secondary metabolites

Teaching scheme and examination scheme:

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	Theory		Practical	
				External	Internal	External	Internal
3	1	4	6	75	25	35	15

Sr. No.	Course Contents	Hours
1	1.1 Metabolic pathways in higher plants - Brief study of basic metabolic pathways and formation of different secondary metabolites through these pathways- Shikimic acid pathway, Acetate pathways. 1.2 Study of utilization of radioactive isotopes in the investigation of Biogenetic studies.	05
2	2.1 Introduction to secondary metabolites: Definition, classification, properties and test for identification of Alkaloids, Glycosides, Flavonoids, Tannins, Volatile oil and Resins 2.2 General introduction, chemical nature, therapeutic uses and commercial applications of following secondary metabolites: 2.2.1 Alkaloids: Vinca, Rauwolfia, Opium, 2.2.2 Glycosides: Senna, Aloes, Bitter Almond 2.2.3 Steroids, Cardiac Glycosides & Triterpenoids: Liquorice, Dioscorea, Digitalis, Gymnema 2.2.4 Phenylpropanoids and Flavonoids: Lignans, Tea 2.2.5 Tannins: Catechu, Pterocarpus 2.2.6 Volatile oils: Mentha, Clove, Cinnamon, Fennel, Coriander 2.2.7 Iridoids and Other terpenoids: Gentian, Artemisia, taxus, carotenoids 2.2.8 Resins: Benzoin, Guggul, Ginger, Asafoetida, Colophony	18
3	Isolation, Identification and Analysis of Phytoconstituents 3.1 Terpenoids: Menthol, Citral 3.2 Glycosides: Glycyrrhetic acid & Rutin 3.3 Alkaloids: Atropine, Quinine, Reserpine, Caffeine 3.4 Resins: Podophyllotoxin, Curcumin	10
4	Industrial production, estimation and utilization of the following phytoconstituents: Sennoside, Diosgenin, Digoxin, Taxol, Vincristine and Vinblastine	08
5	5.1 Basics of Phytochemistry Conventional and modern methods of extraction	06

	5.2 Application of latest techniques like Spectroscopy, chromatography and electrophoresis in the isolation, purification and identification of crude drugs.	
Total Hours		45

Practical

Morphological and microscopical investigation of crude drugs. Understand and apply the concepts of Isolation of phytoconstituents. Detection of phytoconstituents in herbal extract using Chromatographic techniques and chemical tests.

1. Morphology, histology, powder characteristics and TLC: Cinchona, Cinnamon, Senna, Clove, Ephedra, Fennel and Coriander, Liquorice
2. Perform isolation & detection of active principles
 - a. Caffeine - from tea dust.
 - b. Quinine from cinchona bark
 - c. Triammonium glycyrrhizinate from Liquorice root
 - d. Curcumin from Turmeric rhizomes
 - e. Embelin from Vidang
3. Separation of sugars by Paper chromatography
4. Distillation of volatile oils and detection of phytoconstituents by TLC
5. Analysis of crude drugs by chemical tests: (i) Asafoetida (ii) Benzoin (iii) Colophony (iv) Aloes (v) Myrrh (vi) Catechu

Recommended Books (Latest Editions)

1. W.C.Evans, Trease and Evans Pharmacognosy, 16th edition, W.B. Saunders & Co., London, 2009.
2. Mohammad Ali. Pharmacognosy and Phytochemistry, CBS Publishers & Distribution, New Delhi.
3. Text book of Pharmacognosy by C.K. Kokate, Purohit, Gokhlae (2007), 37th Edition, Nirali Prakashan, New Delhi.
4. Herbal drug industry by R.D. Choudhary (1996), 1st Edn, Eastern Publisher, New Delhi.
5. Essentials of Pharmacognosy, Dr.SH.Ansari, 2nd edition, Birla publications, New Delhi, 2007
6. Herbal Cosmetics by H.Pande, Asia Pacific Business press, Inc, New Delhi.
7. A.N. Kalia, Textbook of Industrial Pharmacognosy, CBS Publishers, New Delhi, 2005.
8. R Endress, Plant cell Biotechnology, Springer-Verlag, Berlin, 1994.
9. Pharmacognosy & Pharmacobiotechnology. James Bobbers, Marilyn KS, VE Tylor.
10. The formulation and preparation of cosmetic, fragrances and flavours.
11. Remington's Pharmaceutical sciences.
12. Text Book of Biotechnology by Vyas and Dixit.
13. Text Book of Biotechnology by R.C. Dubey.