

# LJ UNIVERSITY

## LJ INSTITUTE OF PHARMACY

### SEMESTER: III

**Subject Name: PHARMACOGNOSY AND PHYTOCHEMISTRY I**

**Subject Code: BP305TP**

**Scope:** The subject involves the fundamentals of Pharmacognosy like scope, classification of crude drugs, their identification and evaluation of phytochemicals. Preparation and standardization of Ayurvedic dosage forms.

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

1. Summarize history, scope and development of Pharmacognosy, Sources and Classification of crude drugs. Understand concepts of Quality control parameters of Adulteration and Evaluation of drugs of natural origin.
2. Familiarize with Cultivation, Collection of Drugs of Natural Origin.
3. Understand plant tissue culture and role of secondary metabolites.
4. Summarize Role of Pharmacognosy in traditional systems of medicine.
5. Familiarize with Plant Products, primary metabolites containing crude drugs and summarize medicinal agents from marine sources.

**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	<b>1.1 Introduction to Pharmacognosy:</b> (a) Definition, history, scope and development of Pharmacognosy (b) Sources of Drugs – Plants, Animals, Marine & Tissue culture Definitions of Organized drugs, unorganized drugs (dried latex, dried juices, dried extracts, gums and mucilage, oleoresins and oleo- gum -resins). <b>1.2 Classification of drugs:</b> Alphabetical, morphological, taxonomical, chemical, pharmacological, chemo and sero taxonomical classification of drugs <b>1.3 Quality control of Drugs of Natural Origin:</b> Adulteration of drugs of natural origin. Evaluation by organoleptic, microscopic (Quantitative microscopy for crude drugs including lycopodium spore method, leaf constants), physical, chemical and biological methods and properties.	10
2	<b>2.1 Cultivation, Collection, Processing and Storage of Drugs of Natural Origin:</b> Factors influencing cultivation of medicinal plants <b>2.2</b> Plant hormones and their applications. <b>2.3 Biodynamic Agriculture:</b> Good agricultural practices in cultivation of medicinal plants including Organic farming. <b>2.4 Biopesticides/Bioinsecticides</b> <b>2.5 Conservation of specific medicinal plants:</b> In context with endangered medicinal and aromatic plants	10
3	<b>3.1 Plant Tissue Culture:</b> Historical development of plant tissue culture, Nutritional requirements, growth: and their maintenance. <b>3.2</b> Types of cultures,	08

	<b>3.3 Applications of plant tissue culture in pharmacognosy.</b>	
4	<b>4.1 Pharmacognosy in various systems of medicine:</b> Role of Pharmacognosy in allopathy and traditional systems of medicine namely, Ayurveda, Unani, Siddha, Homeopathy <b>4.2 Indian Systems of Medicine</b> Preparation and standardization of Ayurvedic formulations viz Aristas and Asawas, Ghutika, Churna, Lehya and Bhasma.	06
5	<b>Primary metabolites:</b> General introduction, detailed study with respect to sources, preparation, evaluation, chemical nature, preservation, storage, therapeutic used and commercial utility as Pharmaceutical Aids and/or Medicines for the following Primary metabolites: <b>5.1 Carbohydrates:</b> Acacia, Agar, Tragacanth, Honey, Starch, Guar gum <b>5.2 New Polysaccharides:</b> Ashwgandha, Guduchi, Methi, Isabgol <b>5.3 Proteins and Enzymes:</b> Gelatin, proteolytic and amylolytic enzymes (Papain, bromelain, serratiopeptidase, urokinase, streptokinase, pepsin). <b>Plant proteins:</b> Soya protein <b>5.4 Lipids(Waxes, fats, fixed oils) :</b> Castor oil, Chaulmoogra oil, Wool Fat, Bees Wax	07
6	<b>6.1</b> Study of biological source, chemical nature and uses of drugs of natural origin containing following <b>Plant Products:</b> Fibers - Cotton, Coconut, Palm & Natural colorants <b>6.2 Plant products</b> as Natural allergens <b>6.3 Marine Drugs:</b> Medicinal agents from marine sources: Anticancer, Anti-inflammatory, Antibacterial and CVS	04
<b>Total Hours</b>		45

## Practical

Practical application and analytical principles of crude drugs. Performance of chemical tests and physical parameters along with Quantitative microscopy of leaf constants and qualitative and quantitative analysis of cell contents like starch grains, ca oxalate crystals and fibers.

1. Introduction to Microscope and Microscopic techniques.
2. Determination of Fiber length and width
3. Determination of size of starch grains, calcium oxalate crystals by eye piece micrometer
4. Determination of number of starch grains by Lycopodium spore method
5. Determination of stomatal number and index
6. Determination of vein islet number, vein islet termination and palisade ratio.
7. Determination of Ash value and Extractive values of crude drugs
8. Determination of moisture content of crude drugs
9. Determination of swelling index and foaming index
10. To perform preliminary phytochemical screening of crude drugs
11. Analysis of crude drugs by chemical tests: (i) Tragacanth (ii) Acacia (iii) Agar (iv) Gelatin (v) starch (vi) Honey (vii) Castor oil
12. Preparation and evaluation of Marichadi Gutika.
13. Preparation and evaluation of Drakshavaleha.
14. Preparation and evaluation of Churna.

### **Recommended Books:**

1. W.C.Evans, Trease and Evans Pharmacognosy, 16th edition, W.B. Saunders & Co., London, 2009.
2. Tyler, V.E., Brady, L.R. and Robbers, J.E., Pharmacognosy, 9th Edn., Lea and Febiger, Philadelphia, 1988.
3. T.E. Wallis, Textbook of Pharmacognosy, 5th edition, CBS Publishers & Distributors, New Delhi, 2005
4. Mohammad Ali. Pharmacognosy, CBS Publishers & Distributors, New Delhi 2008
5. C.K. Kokate, Purohit, Gokhlae. Text book of Pharmacognosy, Gokhlae (2007), 37th Edition, Nirali Prakashan, Pune, 2007
6. R.D. Choudhary, Herbal Drug Industry 1st Edn, Eastern Publisher, New Delhi, 1996
7. SH.Ansari, Essentials of Pharmacognosy, IInd edition, Birla publications, New Delhi, 2007

8. C.K. Kokate, Practical Pharmacognosy, 5th edition, Vallabh Prakashan, New Delhi, 2016.
9. M.A. Iyengar, Anatomy of Crude Drugs, Manipal Press, Manipal, 2001.
10. Biren Shah & A. K. Seth, Textbook of Pharmacognosy & Phytochemistry, 2nd edition, Elsevier Publication, New Delhi, 2011.
11. Khandelwal K. R. Practical Pharmacognosy, 9th edition, Nirali Prakashan, Pune, 2009
12. Agrawal S.S., Herbal Drug Technology, 2nd edition, Orient Blackswan, New Delhi, 2012.
13. Vyas S. P. and Dixit V. K., Pharmaceutical Biotechnology, 1st edition, CBS Publisher & Distributors, New Delhi, 2016.
14. WHO: Quality Control Methods for Medicinal Plant Materials, World Health ORganisation, Geneva, 1988.