

Subject code: **13PH0603**

Subject name: **Herbal Drug Technology**

Scope: This subject gives the student the knowledge of basic understanding of the herbal drug industry, the quality of raw material, guidelines for quality of herbal drugs, herbal cosmetics, natural sweeteners, nutraceutical, etc. The subject also emphasizes Good Manufacturing Practices (GMP), patenting, and regulatory issues of herbal drugs.

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

1. Understand raw material as a source of herbal drugs from cultivation to herbal drug product
2. Know the WHO and ICH guidelines for the evaluation of herbal drugs.
3. Know the herbal cosmetics, natural sweeteners, nutraceuticals.
4. Appreciate patenting of herbal drugs, GMP.

Teaching and assessment scheme:

Teaching Scheme (Hours)			Credits	Theory/ Tutorial Marks			Practical Marks		Total Marks
Theory	Tutorial	Practical		CSE	IA (I)	ESE (E)	TW	Viva (V)	
3	1	4	6	10	15	75	15	35	150

Theory syllabus:

Teaching hours: 45 Hours

Unit-1

11 Hours

Herbs as raw materials: Definition of herb, herbal medicine, herbal medicinal product, herbal drug preparation Source of Herbs Selection, identification and authentication of herbal materials Processing of herbal raw material Biodynamic Agriculture Good agricultural practices in the cultivation of medicinal plants including Organic farming. Pest and Pest management in medicinal plants: Biopesticides/Bioinsecticides. Indian Systems of Medicine a) Basic principles involved in Ayurveda, Siddha, Unani, and Homeopathy Preparation and standardization of Ayurvedic formulations viz Aristas and Asavas, Ghutika, Churna, Lehya, and Bhasma.

Unit-2

7 Hours

Nutraceuticals: General aspects, Market, growth, scope, and types of products available in the market. Health benefits and role of Nutraceuticals in ailments like Diabetes, CVS diseases, Cancer, Irritable bowel syndrome, and various gastrointestinal diseases. Study of following herbs as a health food: Alfalfa, Chicory, Ginger, Fenugreek, Garlic, Honey, Amla, Ginseng, Ashwagandha, Spirulina Herbal-Drug, and Herb-Food Interactions: General introduction to interaction and classification. Study of following drugs and their possible side effects and interactions: Hypericum, kava-kava, Ginkobiloba, Ginseng, Garlic, Pepper & Ephedra.

Unit-3

10 Hours

Herbal Cosmetics: Sources and description of raw materials of herbal origin used via, fixed oils, waxes, gums colours, perfumes, protective agents, bleaching agents, antioxidants in products such as skin care, hair care, and oral hygiene products. Herbal excipients: Herbal Excipients – Significance of substances of natural origin as excipients –colorants, sweeteners, binders, diluents, viscosity builders, disintegrants, flavors & perfumes. Herbal formulations: Conventional herbal formulations like syrups, mixtures, and tablets and Novel dosage forms like phytosomes.

Unit-4

10 Hours

Evaluation of Drugs: WHO & ICH guidelines for the assessment of herbal drugs Stability testing of herbal drugs. Patenting and Regulatory requirements of natural products: Definition of the terms: Patent, IPR, Farmers right, Breeder's right, Bioprospecting, and Biopiracy, Patenting aspects of Traditional Knowledge and Natural Products. Case study of Curcuma & Neem. Regulatory Issues: Regulations in India (ASU DTAB, ASU DCC), Regulation of manufacture of ASU drugs - Schedule Z of Drugs & Cosmetics Act for ASU drugs

Unit-5

7 Hours

General Introduction to Herbal Industry: Herbal drugs industry: Present scope and prospects. A brief account of plant-based industries and institutions involved in work on medicinal and aromatic plants in India. Schedule-T Good Manufacturing Practice of Indian systems of medicine: Components of GMP (Schedule-T) and its objectives Infrastructural requirements, working space, storage area, machinery and equipment, standard operating procedures, health and hygiene, documentation, and records.

Tutorials will be based on the above syllabus.

Teaching hours: 15 Hours

Practical syllabus:

Teaching hours: 04 Hours/week

1. To perform preliminary phytochemical screening of crude drugs.
2. Determination of the alcohol content of Asava and Arista.
3. Evaluation of excipients of natural origin.
4. Incorporation of a prepared and standardized extract in cosmetic formulations like creams, lotions, and shampoos and their evaluation.
5. Incorporation of a prepared and standardized extract in formulations like syrups, mixtures, and tablets and their evaluation as per Pharmacopoeial requirements.
6. Monograph analysis of herbal drugs from recent Pharmacopoeias.
7. Determination of Aldehyde content.
8. Determination of Phenol content.
9. Determination of total alkaloids.

Recommended References (Latest edition):

1. Textbook of Pharmacognosy by Trease & Evans.
2. Textbook of Pharmacognosy by Tyler, Brady & Robber.
3. Pharmacognosy by Kokate, Purohit, and Gokhale.
4. Essential of Pharmacognosy by Dr. S. H. Ansari.
5. Pharmacognosy & Phytochemistry by V. D. Rangari.
6. Pharmacopoeial standards for Ayurvedic Formulation (Council of Research in Indian Medicine & Homeopathy)
7. Mukherjee, P.W. Quality Control of Herbal Drugs: An Approach to Evaluation of Botanicals. Business Horizons Publishers, New Delhi, India, 2002.