

UNIVERSITY OF MADRAS
B.Sc. DEGREE PROGRAMME IN PLANT BIOLOGY
AND PLANT BIOTECHNOLOGY
 SYLLABUS WITH EFFECT FROM 2023-2024

SKILL ENHANCEMENT COURSES SEC 4

HERBAL TECHNOLOGY

Title of the Course	HERBAL TECHNOLOGY						
Paper Number	Skill Enhancement-4						
Category	Elective	Year	II	Credits	1	CourseCode	239S3A
		Semester	III				
Instructional Hours per week	Lecture		Tutorial		Lab Practice	Total	
	1		-		-	1	
Pre-requisite	To understand the importance of herbal technology.						
Learning Objectives							
C1	To provide students with knowledge of herbal drug industry, the quality of raw material, and guidelines for quality maintenance.						
C2	To gain an insight into the commercially important secondary products and significance of bioprospecting.						
C3	To understand various plants based drugs used in ayurvedha, unani, homeopathy, siddha etc.						
C4	To apply the knowledge to cultivate medical plants.						
C5	To know the pharmacological importance of medicinal plants.						
Course outcomes: On completion of this course, the students will be able to: CO	Programme Outcomes						
1. Define and describe the principle of cultivation of	K1						

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herbal products.	
2. List the major herbs, their botanical name and chemical constituents.	K2
3. Apply techniques for monitoring drug adulteration through the biological testing.	K3
4. Analyze and decipher the significance of various methods of harvesting, drying and storage of medicinal herbs.	K4
5. Develop the skills for cultivation of plants and their value added processing / storage	K5 & K6
UNIT	CONTENTS
I	Herbal Technology: Definition and scope; Herbal medicines: history and scope; Traditional systems of medicine, and overview of AYUSH (Traditional Indian Systems of Medicine);

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	Cultivation - harvesting - processing - storage of herbs and herbal products.
II	Value added plant products: Herbs and herbal products recognized in India; Major herbs used as herbal medicines, nutraceuticals, cosmetics and biopesticides, their Botanical names, plant parts used, major chemical constituents.
III	Pharmacognosy - Systematic position, botany of the plant part used and active principles of the following herbs: Tulsi, Ginger, Curcuma, Fenugreek, Indian Gooseberry, Catharanthus roseus, Withania somnifera, Centella asiatica, Achyranthes aspera, Kalmegh, Giloe (Tinospora), Saravar. Herbal foods, future of pharmacognosy.
IV	Analytical pharmacognosy: Morphological and microscopic examination of herbs, Evaluation of drug adulteration - types, methods of drug evaluation - Biological testing of herbal drugs - Phytochemical screening tests for secondary metabolites (alkaloids, flavonoids, steroids, triterpenoids, phenolic compounds).
V	Plant gene banks, Cultivation of Plants and their value added processing / storage / quality control for use in herbal formulations, Introductory knowledge of Tissue culture and Micro propagation of some medicinal plants (<i>Withania somnifera</i> , neem and tulsi),
Extended Professional Component (is a part of internal component only, Not to be included in the External Examination question paper)	Questions related to the above topics, from various competitive examinations UPSC / TRB / NET / UGC – CSIR / GATE / TNPSC / others to be solved (To be discussed during the Tutorial hour)
Skills acquired from this course	Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill
Recommended Texts	1. AYUSH (www.indianmedicine.nic.in). About the systems—An overview of Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy. New Delhi: Department of Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homoeopathy (AYUSH), Ministry and Family Welfare, Government of India. 2. Evans, W.C. 2009: Trease and Evans PHARMACOGNOSY. 16th Edition, SAUNDERS /

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	<p>Elsevier.</p> <p>3. Sivarajan, V.V. and India, B. 1994. Ayurvedic Drugs and Their Plant Sources.. Oxford & IBH Publishing Company, 1994 - Herbs - 570 pages.</p> <p>4. Miller, L. and Miller, B. 2017. Ayurveda & Aromatherapy: The Earth Essential Guide to Ancient Wisdom and Modern Healing. Motilal Banarsidass,; Fourth edition .</p> <p>5. Kokate, C.K. 2003. Practical Pharmacognosy. Vallabh Prakashan, Pune.</p>
Reference Books	<p>1. Agarwal, P., Shashi, Alok., Fatima, A. and Verma, A. 2013. Current scenario of Herbal Technology worldwide: An overview. Int J Pharm Sci Res; 4(11): 4105-17.</p> <p>2. Arber, Agnes. 1999. Herbal Plants and Drugs. Mangal Deep Publications, Jaipur.</p> <p>3. Varzakas, T., Zakyntinos, G, and Francis Verpoort, F. 2016. Plant Food Residues as a Source of Nutraceuticals and Functional Foods. Foods 5 : 88.</p> <p>4. Aburjai, T. and Natsheh, F.M. 2003. Plants Used in Cosmetics. Phytotherapy Research 17 :987-1000.</p> <p>5. Patri, F. and Silano, V. 2002. Plants in cosmetics: Plants and plant preparations used as ingredients for cosmetic products - Volume 1. ISBN 978-92-871-8474-0, pp 218.</p>
Web resources	<p>1. https://www.kopykitab.com/Herbal-Science</p> <p>2. https://kadampa.org/books/free-ebook-download-howtotyl?gclid=CjwKCAiA6vXwBRBKEiwAYE7iS5t8yenurCIUCTdV9olKo9TbyAh4fsoFqPYWGs5qBTbytD22z7lo0BoCYnUQAvD_BwE</p> <p>3. https://www.barnesandnoble.com/b/free-ebooks/nook-books/alternative-medicine-natural-healing/herbal-medicine/_/N-ry0Z8qaZ11iu</p> <p>4. http://cms.herbalgram.org/heg/volume8/07July/HerbalEBooks.html?t=1310004932&ts=1579066352&signature=1dd0d5aef818b19bcdcd6c063a78e404</p> <p>5. https://www.dattanibookagency.com/books-herbs-science.html</p> <p>6. https://www.springer.com/gp/book/9783540791157</p>

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Mapping with Programme Outcomes:

COs	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3	3	3	2	3	2
CO 2	3	3	3	3	3	3	3	1	3	1
CO 3	3	3	3	3	3	3	3	2	3	2
CO 4	3	3	3	3	3	3	3	1	3	1
CO 5	3	3	3	3	3	3	3	1	3	1

S-Strong (3)

M-Medium (2)

L-Low(1)

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