

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

**ELECTIVE-II (EC- VII**

**1. HORTICULTURE**

<b>Title of the Course</b>	<b>HORTICULTURE</b>						
<b>Paper Number</b>	Elective-II						
<b>Category</b>	Elective	<b>Year</b>	III	<b>Credits</b>	3	<b>Course Code</b>	339E6C
		<b>Semester</b>	VI				
<b>Instructional Hours per week</b>		<b>Lecture</b>		<b>Tutorial</b>		<b>Lab Practice</b>	<b>Total</b>
		3		1		-	4
<b>Pre-requisite</b>		Students should know fundamental knowledge on horticulture applications.					
<b>Learning Objectives</b>							
<b>C1</b>	To gain an understanding of the fundamentals of horticulture and techniques needed to grow and maintain plants.						
<b>C2</b>	To develop skills in students to work as gardeners, therapists, designers, growers and technical advisors in the food and non-food sectors of horticulture.						
<b>C3</b>	To know about hydroponic culture.						
<b>C4</b>	To develop the various horticultural crop protection.						
<b>C5</b>	To impart the knowledge on market preparation.						
<b>Course outcomes:</b>	<b>Programme Outcomes</b>						
On completion of this course, the students will be able to: CO							
1. Enumerate the concepts in horticulture and nursery management.	K1						
2. Demonstrate a working knowledge on	K2						

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biology of soil, compost making, designing and planning of garden, pest, diseases and nutrient management practices.	
3. Appraise the importance of floriculture and evaluate the contribution of spices and condiments on economy.	K3
4. Analyze different methods of weed control in horticultural crops.	K4
5. Develop their competency on pre and post-harvest technology in horticultural crops.	K5 & K6
<b>UNIT</b>	<b>CONTENTS</b>
<b>I</b>	Importance and scope of horticulture. Classification of horticultural crops –fruits and vegetables. Essentials of nursery Management - Soil management: Garden soil, Physical and chemical properties of soil, Organic matter, Compost, Cultural practices; Water management: Water quality, Irrigation, Mulching. Nursery structures: Protected cultivation (greenhouses), environment controls.
<b>II</b>	Hydroponic culture-types of container. Use of manures and fertilizers in Horticultural crop production. Principles of organic farming. Environmental factors influencing vegetable and fruit production.
	Horticultural crop protection; physical control - pruning. Chemical control- pesticides,

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<b>III</b>	fungicides. Plant propagation - cutting, layering, budding, grafting. Types of gardens: formal, informal, kitchen and Terrace. Indoor gardening-bottle garden. Floriculture, ornamental gardening.
<b>IV</b>	A brief account of annual, biennials and perennials with reference to ornamental gardens. Green house, terrarium, water garden, rockery plants, bonsai techniques. Landscaping, principles and basic components.
<b>V</b>	Technology of horticultural crops - market preparation: harvesting and handling, packaging and transport, storage; chemical treatment. Economics of cultivation Crops: Cardamom, pepper, clove. Food processing - freezing, bottling and canning, drying and chemical preservation.
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
<b>Recommended Texts</b>	<ol style="list-style-type: none"> <li>1. Hartmann, H.T and D.E. Kester. 1989. Plant propagation – principles and practices. Half of India. New Delhi.</li> <li>2. Bose, T.K and Mitra and Sadhu. 1991. Propagation of tropical and subtropical horticultural crops. Naya Prakash.</li> <li>3. Singh, S.P. 1989. Mist propagation Metropolitan book Co., New Delhi.</li> <li>4. Chadha, K.L. 1986. Ornamental horticulture in India ICAR, Krishi Bhavan, New Delhi.</li> <li>5. Bose, T.K and Mukharjee, D. 1977. Gardening in India. Oxford &amp; IBH Pub., Co., Calcutta.</li> <li>6. Gopalswamy Iyyangar. 1970. Complete gardening in India, Kalyan</li> </ol>

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	Printers, Bangalore. 7. Rangaswami, G and Mahadevan, A. 1999. Diseases of Crop Plants in India (4th edition). Prentice Hall of India Pvt. Ltd., New Delhi
<b>Reference Books</b>	1. Arditti, A. 1977. Orchid biology, Gornell Univ., Press. Ithaca. 2. Bailey, S. 1971. Perpetual flowering carnation, Fabner and Fabner, London. 3. Laurie, A., Kiplingr, D.D and Nelson, K.S. 1968. Commercial flower forcing. Mc Graw-Hill Book, London. 4. Cumming, R.W. 1964. The chrysanthemum Book. D.Van., Nostrand Inc. 5. Biswas, T.D. 1984. Rose growing – Principles and Practices – Assoc., Pub., Co., New Delhi. 6. Hartman, H.T and Kester, D.E. 1989. Plant propagation. Printice Hall Ltd., New Delhi. 7. Abraham, A and Vatsala, P. 1981. Introduction to Orchids. Trop. Bot. Garden, Trivandrum. 8. Bose, T.K and Yadav, L.P. 1989. Commercial flowers. Naya Prakash, Calcutta. 9. Mc Daniel, G.L. 1982. Ornamental horticulture. Reston Publ., London. 10. Helleyer, A. 1976. The Collingridge Encyclopedia of gardening Chartwell Book, Inc., New Jercy.
<b>Web Resources</b>	1. <a href="https://www.kopykitab.com/Precision-Horticulture-by-Archarya-SK">https://www.kopykitab.com/Precision-Horticulture-by-Archarya-SK</a> 2. <a href="https://www.ebooks.com/en-us/subjects/science-horticulture-ebooks/423/">https://www.ebooks.com/en-us/subjects/science-horticulture-ebooks/423/</a> 3. <a href="http://www.agrimoon.com/horticulture-icar-ecourse-pdf-books/">http://www.agrimoon.com/horticulture-icar-ecourse-pdf-books/</a> 4. <a href="https://www.worldcat.org/title/handbook-of-horticulture/oclc/688653648">https://www.worldcat.org/title/handbook-of-horticulture/oclc/688653648</a> 5. <a href="https://cbseportal.com/ebook/vocational-books-horticulture">https://cbseportal.com/ebook/vocational-books-horticulture</a> 6. <a href="http://www.digitalbookindex.org/ search/search010agriculhortigardena.asp">http://www.digitalbookindex.org/ search/search010agriculhortigardena.asp</a>

**Mapping with Programme Outcomes:**

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

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**S-Strong (3)**

**M-Medium (2)**

**L-Low(1)**