



**University of Kerala**

Discipline	<b>BOTANY</b>				
Course Code	<b>UK5DSEBOT302</b>				
Course Title	<b>HORTICULTURE AND NURSERY MANAGEMENT</b>				
Type of Course	<b>DSE</b>				
Semester	<b>V</b>				
Academic Level	<b>300 - 399</b>				
Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours/Week
	04	03 Hours	-	02 Hours	05 Hours
Pre-requisites	Basic understanding in botany and Basic principles of horticulture or gardening				
Course Summary	The course "Fundamentals of Horticulture and Propagation Techniques" provides students with a comprehensive understanding of essential horticultural principles, including soil management, irrigation techniques, and plant propagation methods such as cutting, layering, budding, and grafting. Through practical exercises and theoretical knowledge, students learn to apply these fundamentals in garden design, nursery management, and sustainable horticulture practices, preparing them for careers in the diverse field of horticulture and agriculture.				

**Detailed Syllabus:**

Module	Unit	Content	Hrs
<b>I</b>	<b>Fundamentals of Horticulture and Propagation Techniques</b>		<b>05</b>
	1	Fundamentals of Horticulture: Definition and scope- importance of horticulture in modern society- divisions of horticulture.	
	2	Soil, Fertility, and Irrigation Management: Understanding soil composition and soil types; Preparation of potting mixtures; Irrigation methods: surface sprinkler, and drip systems.	
	3	Vegetative Propagation Methods: Cutting; Layering- Air layering, Ground layering (Tip, Trench and Compound); Budding- T-budding; Grafting: Approach grafting, Bridge grafting, whip and tongue grafting.	
<b>II</b>	<b>Nutrient Management and Garden Design</b>		<b>09</b>
	4	Manures, Fertilizers: Types- Application methods, Timing and frequency of application, Soil amendments and pH management, Integrated nutrient management.	
	5	Components of Garden: Design ,Principles, Plant Selection, Site, Planting Techniques, Maintenance Practices, Hard Landscaping Elements, Soft Landscaping Elements, Specialty Gardens.	
<b>II</b>	<b>Nursery Management</b>		<b>10</b>
	6	Introduction to Nursery Management: Definition and Significance, Role of Nurseries in Horticultural Production; Types of Nursery enterprises	

	7	Infrastructure and Facilities: Essential Infrastructure for Nursery Operations: Greenhouses, Shade Structures, Propagation Areas; Equipment and Tools for Nursery Management.	
	8	Nursery Stock Selection and Management: Selection Criteria -Ornamentals, Fruit Trees, Shrubs; Procurement and Maintenance of Mother Plants; Inventory Management Techniques for Nursery Stock. Biopesticides, Pest and disease management.	
<b>IV</b>	<b>Entrepreneurship in Nursery Management</b>		<b>06</b>
	9	Business planning and development: Budgeting, Financial Management and Record-keeping, Regulatory requirements and Permits: Legal and Regulatory Requirements for Nursery Operations	
	10	Marketing and Sales Strategies: Market analysis and identification of target customers, Branding, packaging, and product presentation; Effective Marketing Techniques: Advertising, Promotion, and Social Media	
<b>V</b>	<b>Advanced Horticulture Practices and Sustainable Management</b>		<b>15</b>
	11	Advances in Horticulture and Nursery Management: Precision Nursery Management-Remote Sensing, Sensor Networks, Drones; Controlled Environment Agriculture (CEA)- Aquaponics, Hydroponics. Vertical Nursery Production: Vertical Growing Systems, Multi-level Shelving, Stacked Container Systems.,	
	12	Sustainable Horticulture Practices- Organic Farming, Crop Rotation, Sequential Cropping, Polyculture, Agroforestry, Soilless cultivation,	

<b>Practicals</b>			
		1. Study the vegetative propagation techniques described in the syllabus. 2. Visit a Horticultural Nursery to understand its operational procedures, enlist the various components of capital investment and submit a report. 3. Visit a farm practicing sustainable horticulture techniques like organic farming/agroforestry/ hydroponics	<b>30</b>

### Suggested Readings

1. Arteca, Richard N. (2018). Introduction to Horticulture. Pearson.
2. Chand, Sultan Singh, and Malik, Amanullah (2017). Nursery Management. New India Publishing Agency.
3. George, P. V. and Rajagopal, V (2018). Horticulture: Principles and Practices . New India Publishing Agency
4. Govindaraj, G. and Murugesan, R. (2014). Nursery Management Practices of Horticultural Crops. Agrobios (India).

### References

1. Gupta S N (2010) Instant Horticulture, Jain Brothers publishing
2. Hundal S. S and Nanda (2017). Textbook of Horticulture Kalyani Publishers
3. Mishra, R. K. (2018). Handbook of Nursery Management. New India Publishing.
4. Rattanpal H. S, Raj Kumar and Walia S.S (2017). Handbook of Horticulture. Kalyani Publishers
5. Sharma, S.K. (2016). Commercial Horticulture. Rastogi Publications.
6. Singh, A.K. (2017). Nursery Technology. Daya Publishing House.
7. Venkatesha, H. and Natarajan, K.(2015).Handbook of Horticulture. New India Publishing Agency

## Course Outcomes

No.	Upon completion of the course the graduate will be able to	Cognitive Level	PSO addressed
CO-1	Analyze the fundamental principles of garden design to enable students to create aesthetically pleasing and functional outdoor spaces.	U, An	PSO-1
CO2	Understand soil composition, potting mix preparation, and irrigation methods to enhance theoretical understanding of plant growth in horticulture	U	PSO-3
CO-3	Understand various fertilizers and their Role in Crop Production, Develop skills in vegetative propagation methods	U, Ap	PSO-3
CO-4	Master flower arrangement techniques	U, Ap	PSO-3,6
CO-5	Demonstrate understanding of nursery operational procedures and capital investment components, showcasing proficiency in nursery management principles and financial considerations in horticultural enterprises.	An, Ap	PSO-3,8

R-Remember, U-Understand, Ap-Apply, An-Analyze, E-Evaluate, C-Create

**Name of the Course: Horticulture and Nursery management**

**Credits: 3:0:1 (Lecture:Tutorial:Practical)**

CO No.	CO	PO/PSO	Cognitive Level	Knowledge Category	Lecture (L)/Tutorial (T)	Practical (P)
1	1	1	U, AN	C	L	
2	2	3	U	C	L	
3	3	3	U, AP	P		P
4	4	3,6	U	C	L	
5	5	3,8	U, AP	P		P

F-Factual, C- Conceptual, P-Procedural, M-Metacognitive

### Assessment Rubrics:

- Quiz / Assignment/ Quiz/ Discussion / Seminar
- Midterm Exam
- Programming Assignments
- Final Exam

**Mapping of COs to Assessment Rubrics :**

	<b>Internal Exam</b>	<b>Assignment</b>	<b>Project Evaluation</b>	<b>End Semester Examinations</b>
CO 1	✓	✓		✓
CO 2		✓		✓
CO 3	✓	✓		✓
CO 4	✓	✓	✓	✓
CO 5		✓		✓