

## Syllabus on Vocational Education and Training Course (VTC)

<b>Paper Title</b>	<b>: Floriculture and Landscaping -I</b>							
<b>CODE</b>	<b>: VTC: 241.1</b>							
<b>Number of Credits</b>	<b>: 4</b>							
<b>Semester</b>	<b>: III</b>							
<b>No. of Theory Hours Per Week</b>	<b>: One (1 hour)</b>							
<b>No. of Practical Hours per Week</b>	<b>: Three (3 Hours)</b>							
<b>Outline of the Paper:</b>								
<b>Type of Course</b>	<b>Units in the VTC</b>	<b>Hours</b>	<b>Credits</b>	<b>Total Marks</b>	<b>Distribution of Marks (as per OC-8)</b>			
<b>Floriculture and Landscaping - I</b>	<b>Unit-I Theory (25 Marks)</b>	<b>15</b>	<b>4</b>	<b>100</b>	<b>In-Semester</b>		<b>End-Semester</b>	
					<b>Theory</b>	<b>Practical</b>	<b>Theory</b>	<b>Practical</b>
	<b>Unit-II to IV Theory (75 Marks)</b>	<b>90</b>			<b>25</b>	<b>15</b>		<b>60</b>
<b>Marks Distribution</b>	<b>: Internal Assessment: 40</b> <b>: External Assessment: 60</b>							
<b>Course Objectives</b>	<ol style="list-style-type: none"> <li>1. To acquaint the students with the fundamentals of flower cultivation, its importance and different components</li> <li>2. To acquire knowledge and understanding on the importance and cultivation aspects of ornamental plants</li> <li>3. To familiarize with principles and practices of propagation and nursery management for ornamental plants.</li> <li>4. To identify the ornamental plants and develop skills in different methods of the plant propagation, nursery management, bonsai and flower arrangement.</li> <li>5. To provide information about employment, business opportunities and other avenues in the Floriculture sector</li> </ol>							
<b>Course Learning Outcome</b>	After the completion of the course the students are able to: <ol style="list-style-type: none"> <li>1. describe the basics of ornamental horticulture and its cultivation aspects</li> <li>2. use techniques of propagation and nursery management of ornamental plants</li> <li>3. develop skills on flower arrangement, bonsai making</li> <li>4. identify tools and equipment used in gardening</li> </ol>							
<b>Unit I: (Theory) 15 Hours</b>	<ul style="list-style-type: none"> <li>• Definitions, scope and importance of ornamental horticulture.</li> <li>• Floriculture industry and its components, area and production, acquaintance with different types of ornamental plants, its</li> </ul>							

	<p>classification, design values and general cultivation aspects viz. annuals, biennials, trees, shrubs, climbers, indoor plants, cacti and succulents, herbaceous perennials, grasses and bulbous ornamentals, propagation and nursery management, growing media.</p> <ul style="list-style-type: none"> <li>• Importance of flower arrangement, its different styles and type, selection of flowers and cut foliage for arrangement, study of roof garden, water garden, vertical garden, bottle garden, terrariums, dish garden, indoor garden, butterfly garden.</li> <li>• Bonsai- concepts, techniques and maintenance</li> </ul>
<b>UNIT-II: (Practical) 30 Hours</b>	<ul style="list-style-type: none"> <li>• Identification and description of annuals, biennials, trees, shrubs, climbers, indoor plants, cacti and succulents, herbaceous perennials, grasses and bulbous ornamentals.</li> <li>• General cultivation aspects and uses of ornamental plants</li> <li>• Study and identification of various tools and implements</li> </ul>
<b>UNIT-III: (Practical) 30 Hours</b>	<ul style="list-style-type: none"> <li>• Practices of various propagation techniques viz. cuttings, budding, grafting, layering, etc.</li> <li>• Planning and layout of nursery</li> <li>• Preparation of nursery beds and raising of ornamental plants</li> <li>• Identification of growing media and preparation of media for raising ornamental plants</li> <li>• Visit to commercial nursery units</li> </ul>
<b>UNIT-IV: (Practical) 30 Hours</b>	<ul style="list-style-type: none"> <li>• Identification and selection of flowers, containers for floral arrangement</li> <li>• Practices on preparation of different types/styles of flower arrangement</li> <li>• Techniques of bonsai making and its cultural practices</li> <li>• Projectwork on any topic mentioned above</li> </ul>
<b>Suggested Readings</b>	<ol style="list-style-type: none"> <li>1. Arora, J.S. 2006. Introductory Ornamental Horticulture. Kalyani Publishers, Ludhiana</li> <li>2. Bose, Chowdhury and Sharma. 1991. Tropical Garden Plants in colour. Horticulture and allied publishers, 3D Madhab Chatterjee street Kolkata.</li> <li>3. Bose, T.K. Mukherjee, D. 2004. Gardening in India. Oxford &amp; IBH Publishers.</li> </ol>

	<ol style="list-style-type: none"> <li>4. Chadha, K.L. and Chaudhary, B. 1986. Ornamental Horticulture in India. Publication and Information division. ICAR, New Delhi.</li> <li>5. Chowdhury Bimal Das and Balai Lal Jana.2014.Flowering Garden trees. Pointer publishers, Jaipur. India.</li> <li>6. Peter.K.V. 2009.Ornamental plants. New India publishing agency, Pitampura, New Delhi.</li> <li>7. Randhawa, G.S. Amitabha Mukhopadhyay, 2004. Floriculture in India. Allied Publishers Pvt. Ltd., New Delhi.</li> <li>8. Tiwari A.K. and R. Kumar. 2012. <i>Fundamentals of ornamental horticulture and landscape gardening</i>. New India</li> </ol>
<p><b>Requirements</b></p>	<ol style="list-style-type: none"> <li>1. Nursery and Greenhouse</li> <li>2. Gardens</li> <li>3. Propagation Unit</li> <li>4. Floral Arrangement Workshop</li> <li>5. Bonsai Studio</li> </ol> <p><b>Tools and Equipment</b></p> <ol style="list-style-type: none"> <li>1. Horticultural Tools</li> <li>2. Planting Equipment</li> <li>3. Growing Media</li> <li>4. Floral Arrangement Supplies</li> </ol> <p><b>Additional Facilities</b></p> <ol style="list-style-type: none"> <li>1. Computer Lab</li> <li>2. Field Visit Arrangements</li> <li>3. Administrative Office</li> <li>4. Safety and First Aid</li> </ol> <p><b>Any other item as required</b></p>
<p><b>Qualified Instructors</b></p>	<ul style="list-style-type: none"> <li>• Instructors with experience in Floriculture and Landscaping and teaching.</li> <li>• Certifications or relevant qualifications in Floriculture and Landscaping</li> </ul>

<b>Paper Title</b>	<b>: Floriculture and Landscaping -II</b>							
<b>CODE</b>	<b>: VTC: 261.1</b>							
<b>Number of Credits</b>	<b>: 4</b>							
<b>Semester</b>	<b>: IV</b>							
<b>No. of Theory Hours Per Week</b>	<b>: One (1 hour)</b>							
<b>No. of Practical Hours per Week</b>	<b>: Three (3 Hours)</b>							
<b>Outline of the Paper:</b>								
<b>Type of Course</b>	<b>Units in the VTC</b>	<b>Hours</b>	<b>Credits</b>	<b>Total Marks</b>	<b>Distribution of Marks (as per OC-8)</b>			
<b>Floriculture and Landscaping - II</b>	<b>Unit-I Theory (25 Marks)</b>	<b>15</b>	<b>4</b>	<b>100</b>	<b>In-Semester</b>		<b>End-Semester</b>	
					<b>Theory</b>	<b>Practical</b>	<b>Theory</b>	<b>Practical</b>
	<b>Unit-II to IV Theory (75 Marks)</b>	<b>90</b>			<b>25</b>	<b>15</b>	<b>60</b>	
<b>Marks Distribution</b>	<b>: Internal Assessment: 40</b> <b>: External Assessment: 60</b>							
<b>Course Objectives</b>	<ol style="list-style-type: none"> <li>1. To impart basic knowledge about the importance and management of commercial flowers grown in India.</li> <li>2. To explain the principles, theoretical aspects and developing skills in protected cultivation of flower crops</li> <li>3. To train manpower in acquiring skills of value addition in flowers.</li> </ol>							
<b>Course Learning Outcome</b>	<p>After completion of the course students are able to:</p> <ol style="list-style-type: none"> <li>1. develop the required skills on production and management of commercial flower crops</li> <li>2. explain the process of production and post-harvest management of commercial flowers.</li> <li>3. identify on protected structures, cultivation of crops under protection and its management</li> <li>4. develop practical skills on the preparation of various value-added products from flower crops</li> <li>5. design, prepare and apply appropriate combinations of plants and methods of cultivation for commercial setup</li> </ol>							
<b>Unit I: (Theory) 15 Hours</b>	<ul style="list-style-type: none"> <li>• Scope and importance of commercial floriculture in India. Commercial cultivation of the rose, marigold, chrysanthemum, gladiolus, tuberose, orchid, carnation, gerbera, anthurium, bird of paradise, liliun, china aster for domestic and export market, plant protection, postharvest management and handling.</li> <li>• Protected cultivation- its classification, types, design and erection of structures, management and manipulation of environment in protected structures.</li> <li>• Drying and dehydration of flowers; preparation of value-added products from flowers</li> </ul>							

<b>UNIT-II: (Practical)</b> <b>30 Hours</b>	<ul style="list-style-type: none"> <li>• Identification of commercially important floricultural crops.</li> <li>• Special horticultural practices in commercial crops.</li> <li>• Determination of harvest indices and harvesting methods, postharvest handling, packing methods</li> </ul>
<b>UNIT-III: (Practical)</b> <b>30 Hours</b>	<ul style="list-style-type: none"> <li>• Study of various protected structures and practices in design, layout and erection of different types of structures</li> <li>• Microclimate management: different methods to control temperature, carbon dioxide and light</li> <li>• Visit to commercial nurseries, cut flower production enterprises, flower shows, flower markets.</li> </ul>
<b>UNIT-IV: (Practical)</b> <b>30 Hours</b>	<ul style="list-style-type: none"> <li>• Identification and study of plants suitable for drying and dehydration</li> <li>• Practices on drying and dehydration of flowers by different techniques</li> <li>• Preparation of value-added products from fresh flowers, dried flowers, processed products, etc.</li> </ul>
<b>Suggested Readings</b>	<ol style="list-style-type: none"> <li>1. Arora JS. 2010. Introductory Ornamental Horticulture. Kalyani Publishers. 6th edition, pp. 230.</li> <li>2. Bhattacharjee SK. 2018. Advances in Ornamental Horticulture. Vols. I-VI. Pointer Publ. Reprint, pp. 2065.</li> <li>3. Bose TK and Yadav LP. 1989. Commercial Flowers. Naya Prokash, Kolkata, India.</li> <li>4. Bose TK, Maiti, RG, Dhua RS and Das P. 1999. Floriculture and Landscaping. Prokash, Kolkata, India.</li> <li>5. Chadha KL and Bhattacharjee SK. 1995. Advances in Horticulture: Ornamental Plants. Vol. XII, Parts 1 &amp; 2. pp. 533, pp. 574. Malhotra Publ. House, New Delhi, India.</li> <li>6. Chadha KL and Chaudhury B. 1992. Ornamental Horticulture in India. ICAR, New Delhi, India.</li> <li>7. Larson RA. 1980. Introduction to Floriculture. New York Academic Press. pp. 628.</li> <li>8. Laurie A and Rees VH. 2001. Floriculture-Fundamentals and Practices. Agrobios Publications, Jodhpur. pp.534.</li> <li>9. Prasad S and Kumar U. 2003. Commercial Floriculture. Agrobios Publications, Jodhpur.</li> <li>10. Randhawa GS and Mukhopadhyay A. 2001. Floriculture in India. Allied Publ. pp 660.</li> <li>11. Reddy S, Janakiram T, Balaji Kulkarni S and Misra</li> </ol>

	<p>RL. 2007. Hi- Tech Floriculture. Indian Society of Ornamental Horticulture, New Delhi, India.</p> <p>12. Singh AK. 2006. Flower Crops: Cultivation and Management. New India Publ. Agency, New Delhi, India</p>
<p><b>Requirements</b></p>	<p><b>Floriculture Lab</b></p> <p><b>Greenhouse and Protected Cultivation Facilities:</b></p> <ol style="list-style-type: none"> <li>1. Greenhouses/Polyhouses</li> <li>2. Climate Control Systems.</li> </ol> <p><b>Field Facilities:</b></p> <ol style="list-style-type: none"> <li>1. Cultivation Plots</li> <li>2. Nurseries</li> </ol> <p><b>Postharvest Handling and Processing Facilities:</b></p> <ol style="list-style-type: none"> <li>1. Processing Units</li> <li>2. Packaging Units</li> </ol> <p><b>Supporting Facilities:</b></p> <ol style="list-style-type: none"> <li>1. Storage Rooms</li> <li>2. Tool Rooms</li> <li>3. Library</li> </ol> <p><b>IT and Digital Facilities:</b></p> <ul style="list-style-type: none"> <li>• Computer Labs</li> <li>• Internet Access</li> </ul> <p><b>Any other item as required</b></p>
<p><b>Qualified Instructors</b></p>	<ul style="list-style-type: none"> <li>• Instructors with experience in Floriculture and Landscaping and teaching.</li> <li>• Certifications or relevant qualifications in Floriculture and Landscaping</li> </ul>

<b>Paper Title</b>	<b>: Floriculture and Landscaping -III</b>							
<b>CODE</b>	<b>: VTC: 361.1</b>							
<b>Number of Credits</b>	<b>: 4</b>							
<b>Semester</b>	<b>:VI</b>							
<b>No. of Theory Hours Per Week</b>	<b>: One (1 hour)</b>							
<b>No. of Practical Hours per Week</b>	<b>: Three (3 Hours)</b>							
<b>Outline of the Paper:</b>								
<b>Type of Course</b>	<b>Units in the VTC</b>	<b>Hours</b>	<b>Credits</b>	<b>Total Marks</b>	<b>Distribution of Marks (as per OC-8)</b>			
<b>Floriculture and Landscaping III</b>	<b>Unit-I Theory (25 Marks)</b>	<b>15</b>	<b>4</b>	<b>100</b>	<b>In-Semester</b>		<b>End-Semester</b>	
					<b>Theory</b>	<b>Practical</b>	<b>Theory</b>	<b>Practical</b>
	<b>Unit-II to IV Theory (75 Marks)</b>	<b>90</b>			<b>25</b>	<b>15</b>	<b>60</b>	
<b>Marks Distribution</b>	<b>: Internal Assessment: 40</b> <b>: External Assessment: 60</b>							
<b>Course Objectives</b>	<ol style="list-style-type: none"> <li>1. To teach students the basic knowledge required to develop entrepreneurship skills in the development of nursery, gardening and landscaping</li> <li>2. To familiarize with principles and practices of landscaping and ornamental gardening.</li> <li>3. To build human resources as landscape designers, supervisors, gardeners and entrepreneurs in the area of landscaping</li> </ol>							
<b>Course Learning Outcome</b>	After completion of the course students are able to: <ol style="list-style-type: none"> <li>1. explain basic constituents of grape, wine and their storage stability</li> <li>2. demonstrate the Microbial techniques for wine</li> <li>3. evaluate the quality of wine</li> </ol>							
<b>Unit I: (Theory) 15 Hours</b>	<b>Landscape Gardening</b> <ul style="list-style-type: none"> <li>• History of gardening, Styles of gardening-formal, informal, free style and wild gardens.</li> <li>• Steps in preparation of garden design.</li> <li>• Use of Auto CAD and Arch CAD in designing gardens. Principles and elements of landscape design. Importance, design and establishment of garden features/components.</li> <li>• Importance of garden adornments.</li> <li>• Bio aesthetic planning, avenue planting, urban landscaping, landscaping for important public places.</li> <li>• Specialized gardens- rock garden, bog garden, sunken garden, clock garden, sacred groves, etc</li> </ul>							
<b>UNIT-II: (Practical) 30 Hours</b>	<ul style="list-style-type: none"> <li>• Identification and selection of ornamental plants</li> <li>• Study of graphic symbols and notations in landscaping designing and use of drawing equipment</li> <li>• Layout and planning for styles of gardening</li> </ul>							

	<ul style="list-style-type: none"> <li>Practices in preparing design for home gardens, institutional gardens, public places, etc.</li> </ul>
<b>UNIT-III: (Practical) 30 Hours</b>	<ul style="list-style-type: none"> <li>Study of the garden components/features and garden adornments</li> <li>Practices in planning and planting of special types of garden – rock garden, sunken garden, bog garden, dish garden, terrariums, etc.</li> <li>Identification of different types of lawn grasses</li> <li>Practices in laying out a lawn</li> </ul>
<b>UNIT-IV: (Practical) 30 Hours</b>	<ul style="list-style-type: none"> <li>Concept and Application of Computer aided Designing (CAD) for landscape designing</li> <li>Preparation of landscape designs for school and college using CAD technology</li> <li>Visit to parks and botanical gardens</li> </ul>
<b>Suggested Readings</b>	<ol style="list-style-type: none"> <li>Arora, J.S. 2006. Kalyani publishers, Ludhiana. Introductory Ornamental Horticulture. Kalyani publishers, Ludhiana.</li> <li>Bose, T.K. Malti, R.G. Dhua, R.S. &amp; Das, P. 2004. Nayaprakash, Calcutta. Floriculture and Landscaping</li> <li>De, L.C. 2012. Handbook of Gardening, Aavishkar Publishers, Jaipur</li> <li>De,L.C.. Nursery and landscaping.2013. Pointer publishers, Jaipur India.</li> <li>Grewal H.S. and Parminder Singh. 2014. Landscape designing and ornamental plants</li> <li>Randhawa GS &amp; Mukhopadhyay A. 1986. Floriculture in India. Allied Publishers.</li> <li>Randhawa, G.S. and Amitabha Mukhopadhyay 2004. Floriculture in India. Allied Publishers Pvt. Ltd., New Delhi.</li> <li>Roy R.K. Fundamentals of Garden designing. 2013. New India publishing agency, Pitampura, New Delhi.</li> <li>Sabina GT &amp; Peter KV. 2008. Ornamental Plants. New India Publishing Agency, New Delhi.</li> <li>Srivastava.Rajesh 2014. Fundamentals of Garden designing. Agrotech press, Jaipur, New Delhi.</li> <li>Sundaram, v. 2016. Textbook on Commercial flowers and Ornamental Gardening. Kalyani Publishers</li> <li>Syamal, M.M. 2014. Commercial Floriculture. Jaya Publishing House, New Delhi</li> <li>Tiwari A.K. and R. Kumar. 2012. Fundamentals of ornamental horticulture and landscape gardening. New India.</li> </ol>
<b>Requirements</b>	<b>Classroom Facilities</b>

	<ul style="list-style-type: none"> <li>• <b>CAD Labs:</b> Computer labs with AutoCAD, ArchiCAD, and other relevant landscape design software.</li> </ul> <p><b>Laboratory and Workshop Facilities:</b></p> <ol style="list-style-type: none"> <li>1. Landscape Design Lab</li> <li>2. Horticulture Lab</li> </ol> <p><b>Outdoor Facilities:</b></p> <ol style="list-style-type: none"> <li>1. Demonstration Gardens</li> <li>2. Specialized Gardens</li> </ol> <p><b>Practical Training Facilities:</b></p> <ol style="list-style-type: none"> <li>1. Garden Components and Features Area</li> <li>2. Lawn Areas</li> <li>3. Avenue Planting and Urban Landscaping Zones</li> </ol> <p><b>Supporting Facilities:</b></p> <ol style="list-style-type: none"> <li>1. Tool and Equipment Storage.</li> <li>2. Plant Protection and Care Facilities</li> </ol> <p><b>IT and Digital Facilities:</b></p> <ol style="list-style-type: none"> <li>1. High-Speed Internet Access</li> <li>2. Printing and Plotting Equipment</li> </ol> <p><b>Field Visit Arrangements:</b></p> <ol style="list-style-type: none"> <li>1. Transportation</li> <li>2. Partnerships with Local Parks and Gardens</li> </ol> <p><b>Any other item as required</b></p>
<p><b>Qualified Instructors</b></p>	<ul style="list-style-type: none"> <li>• Instructors with experience in Floriculture and Landscaping and teaching.</li> <li>• Certifications or relevant qualifications in Floriculture and Landscaping</li> </ul>