

**Programme:** B.A.

**Course Code:** SEC

**Title of the Course:** Gardening,  
Horticulture and Nursery

**Number of Credits:** 4

**Effective from AY:** 2019-20

<b><u>Prerequisites for the course:</u></b>	Any student pursuing his/her undergraduate programme at Goa University is eligible to take the course as a core paper.	
<b><u>Objective:</u></b>	<p>The main objective of the course is to equip students with the basic skills required for gardening.</p> <p>This introductory course will help students understand the basics of horticulture, floriculture and nursery management and they will further put this knowledge into practice by adopting a patch of land on campus. In addition the students will also visit commercial nurseries and commercial tissue culture laboratory.</p> <p>Students will learn to</p> <ul style="list-style-type: none"><li>- work with various tools used in gardening and nurseries.</li><li>- propagate by seeds, cutting, air-layering and grafting.</li><li>- prepare portable trays, seeds treatment, sowing and seedling production.</li><li>- prepare land for lawn and planting.</li><li>- propagate bulbs, tubers and rhizomes.</li><li>- identify ornamentals and flowering crops and</li><li>- propagate practices in flower crops, medicinal and endemic plants.</li></ul>	
<b><u>Content:</u></b>	<p><b>Unit I: Introduction to Gardening:</b></p> <ol style="list-style-type: none"><li>1. Definition, Objectives, Scope and History.</li><li>2. Various types of Gardening: informal &amp; formal; botanic garden</li><li>3. Home Gardening.</li><li>4. Operations: Soil laying, manuring, watering.</li><li>5. Famous gardens of India.</li></ol> <p><b>Unit II: Propagation techniques:</b></p> <ol style="list-style-type: none"><li>1. Propagation of plants by seeds; seed selection and storage; seed treatment; raising and transplanting seedlings.</li><li>2. Air-layering, types of Cutting, Grafting; treatment and planting of cuttings; rooting medium; hardening of plants.</li><li>3. Propagation of plants by bulbs and bulbils, rhizomes and tubers.</li><li>4. Maintenance of plants: watering and irrigation techniques, manuring; types of fertilizers, application of fertilizers.</li></ol>	<p>8 hours</p> <p>14hours</p>

	<p>5. Green house: shed root, shade house and glass house, mist chambers.</p> <p><b>Unit III: Nursery techniques and its commercial aspect:</b></p> <ol style="list-style-type: none"> <li>1. Features of nursery: Selection of locality and sites; drainage; irrigation; green house; protection and safety; building up of infrastructure for nursery.</li> <li>2. Types of nursery beds: Raised beds, sunken beds, housing beds, transplanting beds.</li> <li>3. Maintenance of plants in nursery.</li> <li>4. Nursery Management and Routine Garden Operations.</li> <li>5. Disease management and harvesting techniques.</li> </ol> <p><b>Unit IV: Floriculture:</b></p> <ol style="list-style-type: none"> <li>1. Annual and Perennial flowering plants; shade loving plants.</li> <li>2. Ornamental bulbous, and foliage plants; Cacti and succulents.</li> <li>3. Indoor plants and their cultivation; Bonsai.</li> <li>4. Factors affecting flower production; Production and packaging of cut flowers; Flower arrangements; Methods to prolong vase life of flowers.</li> <li>5. Cultivation of Important cut flowers (Carnation, Aster, Dahlia, Gerbera, Anthuriums, Gladiolous, Marigold, Rose, Lilium).</li> <li>6. Management of pests, diseases and harvesting.</li> <li>7. Methods of harvesting.</li> </ol> <p><b>Unit V: Horticulture:</b></p> <ol style="list-style-type: none"> <li>1. Ornamental plants: Various horticultural varieties of plants.</li> <li>2. Study of cultivation of different vegetables using various techniques: brinjal, lady's finger, onion, tomatoes, chilly, carrots and spinach.</li> <li>3. Paste management and harvesting techniques.</li> <li>4. Storage and marketing procedures.</li> </ol> <p><b>Unit VI: Medicinal, Endemic, Wild and other useful plants</b></p> <ol style="list-style-type: none"> <li>1. Classification and identification of medicinal plants based on their uses: Vasaka, Tulsi, <i>Aloe vera</i>, etc.</li> <li>2. Various propagation methods use to cultivate medicinal plants; harvesting technique</li> <li>3. Identification of wild endemic plants; use of garden in conservation of endemic and endangered plants</li> </ol>	<p>10hours</p> <p>14hours</p> <p>8hours</p> <p>6hours</p>
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	4. Cultivation techniques for other useful plants like, Cashew, Coconut, 'Neer phanas', etc.	
<b><u>Pedagogy:</u></b>	This skill based course includes lectures and demonstrations on various aspects in addition to practical sessions. Students are encouraged to observe the surrounding biodiversity and journal the same.	
<b><u>References/ Readings</u></b>	<ol style="list-style-type: none"> <li>1. Adams C. R. 2004, Principles of Horticulture, 4th Edt. Elsevier Publication, 2004</li> <li>2. Agrawal, P.K. 1993, Hand Book of Seed Technology, Dept. of Agriculture and Cooperation, National Seed Corporation Ltd., New Delhi.</li> <li>3. Bose T.K. &amp; Mukherjee, D., 1972, Gardening in India, Oxford &amp; IBH Publishing Co., New Delhi.</li> <li>4. Bose, T. K., Yadav, L. P., Pal, P., Parthasarathy, V. A., &amp; Das, P., 2003, Commercial flowers, vol. II. <i>Naya Udyog, Kolkata, India.</i></li> <li>5. Edmond Musser &amp; Andres, Fundamentals of Horticulture, McGraw Hill Book Co., New Delhi.</li> <li>6. Indira, V., &amp; Sudheer, K. P., 2007, Post Harvest technology of horticultural crops <i>Horticulture science. New Delhi: New India Publishing Agency.</i></li> <li>7. Janick Jules. 1979. Horticultural Science. (3rd Ed.), W.H. Freeman and Co., San Francisco, USA.</li> <li>8. Kumar, N., 1997, Introduction to Horticulture, Rajalakshmi Publications, Nagercoil.</li> <li>9. Patil, R. T. 2009. Postharvest Management of Horticultural Produce</li> <li>10. Prasad S. 1999, Greenhouse management for horticultural crop production</li> <li>11. Rao, Manibhushan Textbook of Horticulture.</li> <li>12. Sandhu, M.K., 1989, Plant Propagation, Wile Eastern Ltd., Bangalore, Madras.</li> <li>13. Sheela, V. L., 2008, Flowers for trade (Vol. 10). New India Publishing.</li> <li>14. Swarup, V., 1997, Ornamental horticulture. Macmillan India.</li> </ol>	
<b><u>Learning Outcomes</u></b>	<p>By the end of the course, students will be able to:</p> <ul style="list-style-type: none"> <li>- use a variety of garden tools and implements,</li> <li>- cultivate plants using various propagation techniques</li> <li>- proficiently use layering and grafting techniques</li> <li>- raise healthy nurseries of flowering plants,</li> <li>- manage and maintain plants and vase life of cut flowers</li> <li>- understand harvesting techniques</li> </ul>	

	<ul style="list-style-type: none"><li>- understand commercial aspect of nursery and floriculture</li><li>- use gardening to conserve plants</li></ul>	
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