

# **DEPARTMENT OF BOTANY**

## **COURSE STRUCTURE & SYLLABI** (For the students admitted from year 2023-2024 onwards)

**Programme : DIPLOMA IN HORTICULTURE**



**JAMAL MOHAMED COLLEGE (AUTONOMOUS)**  
Accredited with A++ Grade by NAAC (4<sup>th</sup> Cycle) with CGPA 3.69 out of 4.0  
(Affiliated to Bharathidasan University)  
**TIRUCHIRAPPALLI – 620 020**

## DIPLOMA IN HORTICULTURE

[illegible]

Semester	Course Code	Course Category	Total Hours	Credits	Marks for Evaluation		
					CIA	ESE	Total
I	23DHO1CC1	General	60	4	25	75	100

Course Title	<b>FUNDAMENTALS OF HORTICULTURE</b>
--------------	-------------------------------------

SYLLABUS		
Unit	Contents	Hours
I	<b>Fundamentals of horticulture:</b> Definition, classification, scope and importance. Soil – Kinds of soil, physical and chemical properties and soil fertility. Climate – Basic environmental components. Systems of irrigation – surface, underground and special irrigation methods.	12
II	<b>Establishment of orchards and cultivation:</b> Location, site, planning, layout, planting seasons, systems, distance and transplanting methods of orchards. Methods of soil management practices – clean culture, cover culture, mulching, sod and sod mulching. Inter, mixed and multitier cropping. Training, pruning and *weed management in orchards*.	12
III	<b>Nutrients of horticultural crops:</b> Organic manures – night soil, guana, bones, oil cakes, leaf mould, farmyard manure and vermi-compost. Inorganic fertilizers – nitrogen, phosphate, potash and mixed fertilizers. *Biofertilizers – Algal, fungi and Bacterial*. Application of fertilizers and manures.	12
IV	<b>Horticultural applications of growth regulators:</b> History and types. Role of plant growth regulators in horticulture – Propagation of plant, control of flowering, fruit setting, fruit size and quality, pre-harvest fruit drop, *weed and dormancy*. induction of parthenocarpy, blossom thinning, fruit ripening and arresting plant growth.	12
V	<b>Pomology and olericulture:</b> Classification and types of fruits, cultivation practices of Mango, Papaya, Jack fruit, Pomegranate and Citrus. Classification of vegetables, types of vegetable growing and *cultural aspects of vegetables*. Vegetables cultivation suitable for tropical climate – Brinjal, Lady's finger, Tomato and cucurbit varieties.	12
VI	<b>Current Trends (For CIA only) – Horticultural zones in Tamil Nadu and India and cultural aspects of vegetables</b>	

\*.....\* Self Study

<b>Text Book(s):</b>
1. Gupta SN, Instant Horticulture, 16 <sup>th</sup> Edition, Jain Brothers Pvt Ltd, New Delhi, India, 2010. 2. Sheela VL, Horticulture, 1 <sup>st</sup> Edition, MJP Pvt Ltd, Chennai, Tamil Nadu, India, 2011. 3. Kumar N, Introduction to Horticulture, 8 <sup>th</sup> Edition, Medtech, Scientific International Pvt Ltd, New Delhi, India, 2017.

<b>Reference Book(s):</b>
1. George A, Horticulture: Principles and Practices, 4 <sup>th</sup> Edition, Prentice Hall India Learning Pvt Ltd, New Delhi, India, 2009. 2. Peter KV, Basics of Horticulture, 2 <sup>nd</sup> Revised Edition, New India Publishing Agency Pvt Ltd, New Delhi, India, 2009.
<b>Web Resource(s):</b>

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	CO Statement	Cognitive Level (K-Level)
CO1	Describe the scope and significance of horticultural practices.	K1
CO2	Observe and develop orchards and recall its managements.	K2
CO3	Apply the green manuring and organic fertilizers.	K3
CO4	Analyze and appraise appropriate plant growth stimulating and inhibiting hormones.	K4
CO5	Estimate economic implications of cultivation of tropical and subtropical fruits and vegetable crops.	K5

#### Relationship Matrix:

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	03	02	02	01	02	03	02	01	02	02	2.0
CO2	02	03	02	02	01	02	03	02	02	01	2.0
CO3	01	02	03	02	02	02	01	03	02	02	2.0
CO4	03	01	02	01	02	02	02	02	03	02	2.0
CO5	02	02	01	02	02	02	02	02	01	03	1.9
Mean Overall Score											2.0
Correlation											Medium

Mean Overall Score	Correlation
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

**Course Coordinator: Dr. N. AHAMED SHERIF**

Semester	Course Code	Course Category	Total Hours	Credits	Marks for Evaluation		
					CIA	ESE	Total
I	23DHO1CC2	General	60	4	25	75	100

Course Title	<b>PLANT PROPAGATION PRACTICES</b>
--------------	------------------------------------

SYLLABUS		
Unit	Contents	Hours
I	<b>Asexual and Sexual propagation:</b> Definition. Microsporogenesis and megasporogenesis. Apomixis – types and significance. Polyembryony. Advantages and disadvantages of asexual and sexual propagation. Genetic instability. *Propagation by specialized plants parts*.	12
II	<b>Plant propagation through cottage:</b> Types and methods of cuttage (leaf, leaf bud, stem and root). Regeneration of plants from cuttage. *Advantages and disadvantages*.	12
III	<b>Plant propagations through layering:</b> Types and methods of layering (simple, serpentine trench, tip, stooling and air layering). Anatomical and physiological basis of rooting. *Advantages and disadvantages of layering*.	12
IV	<b>Plant propagations through grafting and budding:</b> Grafting – Stock and scion concept, rootstocks, factors for successful graft union, formation of graft union, grafting types, methods and incompatibility. Budding – types, methods and limitations. *Advantages and disadvantages*.	12
V	<b>Micropropagation:</b> Scope and requirements. Procedure for micropropagation. Various methods of culturing plant tissues and organs. Deflasking, hardening and acclimatization. Potting mixtures for micropropagated plants. *Advantages and bottlenecks in micropropagation*.	12
VI	<b>Current Trends (For CIA only) – Propagation by specialized plants parts</b>	

\*.....\* Self Study

<b>Text Book(s):</b>
<ol style="list-style-type: none"> <li>1. Reddy M and Rao A, Plant propagation in Horticulture, 1<sup>st</sup> Edition, Pacific Book International Pvt Ltd, New Delhi, India, 2009.</li> <li>2. Sheela VL, Horticulture, 1<sup>st</sup> Edition, MJP Pvt Ltd, Chennai, Tamil Nadu, India, 2011.</li> <li>3. Kumar N, Introduction to Horticulture, 8<sup>th</sup> Edition, Medtech, Scientific International Pvt Ltd, New Delhi, India, 2017.</li> </ol>
<b>Reference Book(s):</b>
<ol style="list-style-type: none"> <li>1. Michael Dirr A and Charles Heuser W, Reference manual of woody plant propagation: From seed to tissue culture, 2<sup>nd</sup> Edition, Timber Press Pvt Ltd, United States of America, 2006.</li> <li>2. Hartmann HT, Kester DE, Fred T, Davies JR, Robert LG, Plant Propagation: Principle and Practices, 1<sup>st</sup> Edition, Pearson Education Pvt, Ltd, United States of America, 2017.</li> </ol>
<b>Web Resource(s):</b>

<b>Course Outcomes</b>		
Upon successful completion of this course, the student will be able to:		
<b>CO No.</b>	<b>CO Statement</b>	<b>Cognitive Level (K-Level)</b>
CO1	Enumerate the concept of natural propagation, growth and development system in plants.	<b>K1</b>
CO2	Select suitable planting materials for cottage, layering, graftage and budding mediated plant propagation.	<b>K2</b>
CO3	Determine the advantages and disadvantages of various propagation system.	<b>K3</b>
CO4	Analyze factors affecting artificial plant propagation.	<b>K4</b>
CO5	Evaluate pathogen free clones <i>in vitro</i> and maintenance of true to true type of plant species.	<b>K5</b>

**Relationship Matrix:**

<b>Course Outcomes (COs)</b>	<b>Programme Outcomes (POs)</b>					<b>Programme Specific Outcomes (PSOs)</b>					<b>Mean Score of Cos</b>
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>	
<b>CO1</b>	03	02	02	01	02	03	02	01	02	02	<b>2.0</b>
<b>CO2</b>	02	03	02	02	01	02	03	02	02	01	<b>2.0</b>
<b>CO3</b>	01	02	03	02	02	02	02	03	02	02	<b>2.1</b>
<b>CO4</b>	03	01	02	02	02	02	02	02	03	02	<b>2.1</b>
<b>CO5</b>	02	02	02	02	02	02	02	02	02	03	<b>2.1</b>
<b>Mean Overall Score</b>											<b>2.1</b>
<b>Correlation</b>											<b>Medium</b>

<b>Mean Overall Score</b>	<b>Correlation</b>
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

**Course Coordinator:**

**Dr. N. AHAMED SHERIF**

Semester	Course Code	Course Category	Total Hours	Credits	Marks for Evaluation		
					CIA	ESE	Total
<b>I</b>	<b>23DHO1CC3</b>	<b>General</b>	<b>60</b>	<b>4</b>	<b>25</b>	<b>75</b>	<b>100</b>
<b>Course Title</b>		<b>FLORICULTURE</b>					

SYLLABUS		
Unit	Contents	Hours
<b>I</b>	<b>Diversification of floriculture:</b> Scope and importance of floriculture. Classification of flowering plants. Traditional and protected cultivation of flowers (site, soil and layout). Flower seed production and flower beds. *Colour scheme and grouping*.	<b>12</b>
<b>II</b>	<b>Cultivation methods:</b> Cultivation methods of Rose, Marigold, Chrysanthemum, Jasmine, Dahlia, Orchid and Crossandra. Training and pruning of flowering plants. *Ornamental bulbous plant – Cacti, succulents, palms, cycads and ferns*.	<b>12</b>
<b>III</b>	<b>Cut flower technology:</b> Production, packaging, drying and preservation. Post-harvest technology of cut flowers. Cut flower production techniques for domestic and export market with special reference to rose, *Marigold, Chrysanthemum*, Anthurium, Gladiolus, Jasmine, Dahlia, Tuberose, Gerbera, Orchid and Crossandra.	<b>12</b>
<b>IV</b>	<b>A profitable floriculture industry:</b> Vase life – prolonging the vase life of flowers. Flower arrangements – Practices and preparation of floral bouquets and decorations. *Preparation of floral rangoli, veni and ikebana*. Dry flowers – techniques of drying, preservation, bleaching, dyeing, painting, storage and products.	<b>12</b>
<b>V</b>	<b>Entrepreneurship in Floriculture:</b> Marketing of floriculture products – methods, publicity and marketing mix. Schemes and supporting agencies for entrepreneurship of floriculture – APEDA, DIC, SIDA, SISI, NSIC, SIDO. Investment procurement – project formation, feasibility, legal formalities, shop act, estimation and costing, investment procedure, loan procurement, *banking processes and export strategies*.	<b>12</b>
<b>VI</b>	<b>Current Trends (For CIA only)</b> – Knowledge on export and import strategies of floriculture. Environmental impact on cut flower industry.	

\*.....\* Self Study

<b>Text Book(s):</b>
<ol style="list-style-type: none"> <li>1. Sheela VL, Horticulture, 1<sup>st</sup> Edition, MJP Pvt Ltd, Chennai, Tamil Nadu, India, 2011.</li> <li>2. Arora JS, Introductory Ornamental Horticulture, 2<sup>nd</sup> Edition, Kalyani Publishers Pvt Ltd, New Delhi, India, 2016.</li> <li>3. Randhawa GS and Mukhopadyay AN, Floriculture in India, 1<sup>st</sup> Edition (Reprinted), Allied Publishers Pvt Ltd, Chennai, Tamil Nadu, India, 2015.</li> </ol>
<b>Reference Book(s):</b>
<ol style="list-style-type: none"> <li>1. Brain M, Flowering Bulbs for the Garden (The Royal Botanical Gardens, KEW in association with COLLINGRIDE), 8<sup>th</sup> Edition, The Himalayan Publishing Group Pvt Ltd, Kew, London, 2013.</li> <li>2. Chadha KL and Choudhury B, Ornamental Horticulture in India, 6<sup>th</sup> Edition, ICAR, New Delhi, India, 2014.</li> </ol>

<b>Web Resource(s):</b>	
1.	<a href="http://www.apeda.gov.in/apedawebsite/SubHead_Products/Floriculture.htm">http://www.apeda.gov.in/apedawebsite/SubHead_Products/Floriculture.htm</a>
2.	<a href="https://agriexchange.apeda.gov.in/indexp/Product_description_32head.aspx?gcode=01013">https://agriexchange.apeda.gov.in/indexp/Product_description_32head.aspx?gcode=01013</a>
3.	<a href="https://agriexchange.apeda.gov.in/FTP/ftp2015-20E">https://agriexchange.apeda.gov.in/FTP/ftp2015-20E</a>
4.	<a href="http://www.Anilrana13014.webbly.com">www.Anilrana13014.webbly.com</a>
5.	<a href="https://www.zauba.com/export-INDIAN+FRESH+FLOWERS-hs-code.html">https://www.zauba.com/export-INDIAN+FRESH+FLOWERS-hs-code.html</a>

<b>Course Outcomes</b>		
Upon successful completion of this course, the student will be able to:		
<b>CO No.</b>	<b>CO Statement</b>	<b>Cognitive Level (K-Level)</b>
<b>CO1</b>	Recognize the fundamentals of floriculture.	<b>K1</b>
<b>CO2</b>	Employ various cultivation practices for flowering plants in commercial scale.	<b>K2</b>
<b>CO3</b>	Construct quality planting material of ornamentals and flowering plants.	<b>K3</b>
<b>CO4</b>	Standardize and practices for production, preparation, and packaging of the commercially important cut flowers and flower based decorative products.	<b>K4</b>
<b>CO5</b>	Explain the personal finance, entrepreneurship and manage/organize related task in day-to-day work for personal & societal growth.	<b>K5</b>

**Relationship Matrix:**

<b>Course Outcomes (COs)</b>	<b>Programme Outcomes (POs)</b>					<b>Programme Specific Outcomes (PSOs)</b>					<b>Mean Score of Cos</b>
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>	
<b>CO1</b>	02	02	03	02	01	02	02	03	02	01	<b>2.0</b>
<b>CO2</b>	01	03	02	02	02	02	03	01	02	02	<b>2.0</b>
<b>CO3</b>	02	02	02	03	02	02	01	03	02	02	<b>2.1</b>
<b>CO4</b>	02	01	02	03	02	01	02	02	03	02	<b>2.0</b>
<b>CO5</b>	03	02	02	02	03	02	02	02	02	03	<b>2.2</b>
<b>Mean Overall Score</b>											<b>2.6</b>
<b>Correlation</b>											<b>Medium</b>

<b>Mean Overall Score</b>	<b>Correlation</b>
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

**Course Coordinator:**

**Dr. N. AHAMED SHERIF**



Semester	Course Code	Course Category	Total Hours	Credits	Marks for Evaluation		
					CIA	ESE	Total
I	23DHO1CC4P	Skill	180	6	20	80	100

Course Title	<b>FUNDAMENTALS OF HORTICULTURE – PRACTICAL</b>
--------------	---

SYLLABUS		
Unit	Contents	Hours
	<p><b>List of Practical's:</b></p> <ol style="list-style-type: none"> <li>1. Categorization of horticultural crops in Tamil Nadu based on use, plant type and usable plant part.</li> <li>2. Soil less plant culture – Hydroponics.</li> <li>3. Skill learning and practicing nursery bed preparation.</li> <li>4. Practicing irrigation for irrigated crops.</li> <li>5. Use of plant growth regulators – IAA/NAA/IBA, Kinetin, ABA and GA.</li> <li>6. Identify horticultural orchard weed and earthing up.</li> <li>7. Practicing application of organic, inorganic and green manures.</li> <li>8. Spray volume calculation and foliar application of fertilizers.</li> <li>9. Pruning practices in horticultural trees.</li> <li>10. Practicing the use of special garden implements (Seed drill, rotary weeder, Mower and sprayers, litter blower).</li> <li>11. Identification of major conditions responsible for spoilage of horticultural crops.</li> <li>12. Field trips: Field visit to standing crop sites, nurseries, vegetable gardens and horticultural fields at agricultural institutes / universities or other suitable locations.</li> </ol>	<b>180</b>

<b>Text Book(s):</b>
<ol style="list-style-type: none"> <li>1. Sheela VL, Horticulture, 1<sup>st</sup> Edition, MJP Pvt Ltd, Chennai, Tamil Nadu, India, 2011.</li> <li>2. Arora JS, Introductory Ornamental Horticulture, 2<sup>nd</sup> Edition, Kalyani Publishers Pvt Ltd, New Delhi, India, 2016.</li> <li>3. Randhawa GS and Mukhopadyay AN, Floriculture in India, 1<sup>st</sup> Edition (Reprinted), Allied Publishers Pvt Ltd, Chennai, Tamil Nadu, India, 2015.</li> </ol>

<b>Reference Book(s):</b>
<ol style="list-style-type: none"> <li>1. Brain M, Flowering Bulbs for the Garden (The Royal Botanical Gardens, KEW in association with COLLINGRIDE), 8<sup>th</sup> Edition, The Himalayan Publishing Group Pvt Ltd, Kew, London, 2013.</li> <li>2. Chadha KL and Choudhury B, Ornamental Horticulture in India, 6<sup>th</sup> Edition, ICAR, New Delhi, India, 2014.</li> </ol>

<b>Web Resource(s):</b>
<ol style="list-style-type: none"> <li>1. <a href="http://www.apeda.gov.in/apedawebsite/SubHead_Products/Floriculture.htm">http://www.apeda.gov.in/apedawebsite/SubHead_Products/Floriculture.htm</a></li> <li>2. <a href="https://agriexchange.apeda.gov.in/index/Product_description_32head.aspx?gcode=01013">https://agriexchange.apeda.gov.in/index/Product_description_32head.aspx?gcode=01013</a></li> <li>3. <a href="https://agriexchange.apeda.gov.in/FTP/ftp2015-20E">https://agriexchange.apeda.gov.in/FTP/ftp2015-20E</a></li> <li>4. <a href="http://www.Anilrana13014.webbly.com">www.Anilrana13014.webbly.com</a></li> <li>5. <a href="https://www.zauba.com/export-INDIAN+FRESH+FLOWERS-hs-code.html">https://www.zauba.com/export-INDIAN+FRESH+FLOWERS-hs-code.html</a></li> </ol>

<b>Course Outcomes</b>		
Upon successful completion of this course, the student will be able to:		
<b>CO No.</b>	<b>CO Statement</b>	<b>Cognitive Level (K-Level)</b>
<b>CO1</b>	Recognize the fundamentals of floriculture.	<b>K1</b>
<b>CO2</b>	Employ various cultivation practices for flowering plants in commercial scale.	<b>K2</b>
<b>CO3</b>	Construct quality planting material of ornamentals and flowering plants.	<b>K3</b>
<b>CO4</b>	Standardize and practices for production, preparation, and packaging of the commercially important cut flowers and flower based decorative products.	<b>K4</b>
<b>CO5</b>	Explain the personal finance, entrepreneurship and manage/organize related task in day-to-day work for personal & societal growth.	<b>K5</b>

**Relationship Matrix:**

<b>Course Outcomes (COs)</b>	<b>Programme Outcomes (POs)</b>					<b>Programme Specific Outcomes (PSOs)</b>					<b>Mean Score of Cos</b>
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>	
<b>CO1</b>	<b>02</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>01</b>	<b>2.0</b>
<b>CO2</b>	<b>01</b>	<b>03</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>03</b>	<b>01</b>	<b>02</b>	<b>02</b>	<b>2.0</b>
<b>CO3</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>03</b>	<b>02</b>	<b>02</b>	<b>2.1</b>
<b>CO4</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>2.0</b>
<b>CO5</b>	<b>03</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>03</b>	<b>2.2</b>
<b>Mean Overall Score</b>											<b>2.6</b>
<b>Correlation</b>											<b>Medium</b>

<b>Mean Overall Score</b>	<b>Correlation</b>
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

**Course Coordinator:**

**Dr. N. AHAMED SHERIF**

Semester	Course Code	Course Category	Total Hours	Credits	Marks for Evaluation		
					CIA	ESE	Total
I	23DHO1CC5P	Skill	180	6	20	80	100
Course Title		PLANT PROPAGATION PRACTICES – PRACTICAL					

SYLLABUS		
Unit	Contents	Hours
	<p><b><u>List of Practical's</u></b></p> <p>Plant propagation techniques</p> <ol style="list-style-type: none"> <li>1. Cuttage.</li> <li>2. Layering</li> <li>3. Grafting.</li> <li>4. Budding.</li> <li>5. Propagation by using specialized plant parts.</li> <li>6. Preparation of pot mixture, potting and repotting.</li> <li>7. Micropropagation.               <ol style="list-style-type: none"> <li>a) Sterilization procedures.</li> <li>b) Handling of weighing balance, laminar air flow chamber, pH meter and autoclave.</li> <li>c) Preparation of stock solutions for medium preparation.</li> <li>d) Preparation of solid and liquid medium.</li> <li>e) <i>In vitro</i> culture methods using different types of explants.</li> <li>f) Hardening and transplantation of regenerated plants.</li> </ol> </li> </ol>	180

<b>Text Book(s):</b>
<ol style="list-style-type: none"> <li>1. Sheela VL, Horticulture, 1<sup>st</sup> Edition, MJP Pvt Ltd, Chennai, Tamil Nadu, India, 2011.</li> <li>2. Arora JS, Introductory Ornamental Horticulture, 2<sup>nd</sup> Edition, Kalyani Publishers Pvt Ltd, New Delhi, India, 2016.</li> <li>3. Randhawa GS and Mukhopadyay AN, Floriculture in India, 1<sup>st</sup> Edition (Reprinted), Allied Publishers Pvt Ltd, Chennai, Tamil Nadu, India, 2015.</li> </ol>
<b>Reference Book(s):</b>
<ol style="list-style-type: none"> <li>1. Brain M, Flowering Bulbs for the Garden (The Royal Botanical Gardens, KEW in association with COLLINGRIDE), 8<sup>th</sup> Edition, The Himalayan Publishing Group Pvt Ltd, Kew, London, 2013.</li> <li>2. Chadha KL and Choudhury B, Ornamental Horticulture in India, 6<sup>th</sup> Edition, ICAR, New Delhi, India, 2014.</li> </ol>
<b>Web Resource(s):</b>
<ol style="list-style-type: none"> <li>1. <a href="http://www.apeda.gov.in/apedawebsite/SubHead_Products/Floriculture.htm">http://www.apeda.gov.in/apedawebsite/SubHead_Products/Floriculture.htm</a></li> <li>2. <a href="https://agriexchange.apeda.gov.in/index/Product_description_32head.aspx?gcode=01013">https://agriexchange.apeda.gov.in/index/Product_description_32head.aspx?gcode=01013</a></li> <li>3. <a href="https://agriexchange.apeda.gov.in/FTP/ftp2015-20E">https://agriexchange.apeda.gov.in/FTP/ftp2015-20E</a></li> <li>4. <a href="http://www.Anilrana13014.webbly.com">www.Anilrana13014.webbly.com</a></li> <li>5. <a href="https://www.zauba.com/export-INDIAN+FRESH+FLOWERS-hs-code.html">https://www.zauba.com/export-INDIAN+FRESH+FLOWERS-hs-code.html</a></li> </ol>

<b>Course Outcomes</b>		
Upon successful completion of this course, the student will be able to:		
<b>CO No.</b>	<b>CO Statement</b>	<b>Cognitive Level (K-Level)</b>
<b>CO1</b>	Observe the plants according to their nature and parts used.	<b>K1</b>
<b>CO2</b>	Identify soil and soil less cultivation methods.	<b>K2</b>
<b>CO3</b>	Determine nursery bed preparation, utilizing hormones and methods of irrigation.	<b>K3</b>
<b>CO4</b>	Distinguish orchard weeds & their control and know how to apply the organic & inorganic fertilizers.	<b>K4</b>
<b>CO5</b>	Appraise special garden equipment's and machinery.	<b>K5</b>

**Relationship Matrix:**

<b>Course Outcomes (COs)</b>	<b>Programme Outcomes (POs)</b>					<b>Programme Specific Outcomes (PSOs)</b>					<b>Mean Score of Cos</b>
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>	
<b>CO1</b>	<b>03</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>02</b>	<b>1.9</b>
<b>CO2</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>2.0</b>
<b>CO3</b>	<b>01</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>1.9</b>
<b>CO4</b>	<b>03</b>	<b>01</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>2.0</b>
<b>CO5</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>03</b>	<b>1.9</b>
<b>Mean Overall Score</b>											<b>1.8</b>
<b>Correlation</b>											<b>Medium</b>

<b>Mean Overall Score</b>	<b>Correlation</b>
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

**Course Coordinator: Dr. N. AHAMED SHERIF**

Semester	Course Code	Course Category	Total Hours	Credits	Marks for Evaluation		
					CIA	ESE	Total
I	23DHO1IN	Skill	180	6	--	--	100
Course Title		FLORICULTURE – INTERNSHIP					

SYLLABUS		
Unit	Contents	Hours
	<p><b><u>List of Practical's come Internship</u></b></p> <ol style="list-style-type: none"> <li>1. Soil cultivation and area preparation.</li> <li>2. Flower's seed production and bed preparation.</li> <li>3. Seedling for plantation.</li> <li>4. Irrigation and organic mulching.</li> <li>5. Practicing on flower bud capping with net material.</li> <li>6. Practicing on flower harvesting and separation based on size, colour, length etc.</li> <li>7. Practicing on flower bunching, packing, marketing and export.</li> <li>8. Practices and preparation of floral bouquets and decorations.</li> </ol>	180

<b>Text Book(s):</b>
<b>Reference Book(s):</b>
<b>Web Resource(s):</b>

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	CO Statement	Cognitive Level (K-Level)
CO1	Select desirable flower seed materials for floral bed preparation.	K1
CO2	Summarize suitable varieties for plantation in different geographical locations.	K2
CO3	Experiment flowers based on size, shape and colour during post-harvesting of commercial flowers.	K3
CO4	Appraise different types of boxes used for packing and export of commercial flowers.	K4
CO5	Choose floral bouquets and decoration for flower shows to market their commercial flowers.	K5

**Relationship Matrix:**

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	03	02	02	02	02	03	02	02	02	02	2.2
CO2	02	03	02	02	01	02	03	02	02	02	2.1
CO3	02	02	03	02	02	02	02	03	02	03	2.1
CO4	03	02	02	02	02	02	02	02	03	02	2.2
CO5	02	02	01	03	02	02	02	02	02	03	2.2
Mean Overall Score											2.2
Correlation											Medium

Mean Overall Score	Correlation
< 1.5	Low
$\geq 1.5$ and < 2.5	Medium
$\geq 2.5$	High

**Course Coordinator:****Dr. N. AHAMED SHERIF**

Semester	Course Code	Course Category	Total Hours	Credits	Marks for Evaluation		
					CIA	ESE	Total
II	23DHO2CC6	General	60	4	25	75	100

Course Title	SEED SCIENCE AND TECHNOLOGY
--------------	-----------------------------

SYLLABUS		
Unit	Contents	Hours
I	<b>Introduction:</b> Seed morphology, anatomy and its types. Seed dormancy – possible reasons and methods of breaking dormancy. Concept of seed technology, difference between seed and grains, seed quality, relationships to the other sciences, role and goals of seed technology. *Seed industries in India*.	12
II	<b>Seed production in vegetable crops:</b> General principles and methods. Identification of areas, compact area approach and *factor affecting in seed production*. Climatic requirements, cultural practices, isolation distance, rouging, seed standards, extraction and processing. Seed production techniques in solanaceous vegetables, peas, beans, okra, cucurbits, onion, cole and root crops.	12
III	<b>Seed production in flower crops:</b> Indian scenario in flower seeds production, different groups of seeds, formula mix, *pollination behavior*, isolation and pollination management. Hybrid seed production, harvesting and threshing. Seed yield in important annuals and maintenance of the variety.	12
IV	<b>Seed testing:</b> Seed sampling, determination of density, purity and genuineness of varieties. Seed viability, moisture, vigour, health, age testing and *germination*.	12
V	<b>Seed processing, storage, certification and marketing:</b> Seed processing, drying, cleaning, upgrading, treatment, packaging, handling and storage. Seed certification, minimum seed certification standards, field and seed inspection. Seed legislation, *law enforcement* and marketing.	12
VI	<b>Current Trends (For CIA only) – Opportunities for seed technologists.</b>	

\*.....\* Self Study

<b>Text Book(s):</b>
1. Agarwal PK, Principles of Seed Technology, 1 <sup>st</sup> Edition, ICAR, New Delhi, India, 2010. 2. Basavaraju GV, Ravishankar P and Sarika G, 2 <sup>nd</sup> Edition, A Text book of Seed Science and Technology, Kalyani Publishers Pvt Ltd, New Delhi, India, 2014. 3. Rattan Lal A, Seed Technology, 2 <sup>nd</sup> Edition, Oxford & IBH Publishing Pvt Ltd, New Delhi, India, 2017.
<b>Reference Book(s):</b>
1. Lawrence OC and Miller FM, Principles of Seed Science and Technology, 1 <sup>st</sup> Edition, Springer, 2002. 2. Vanangamudi K, Seed Science and Technology, 2 <sup>nd</sup> Edition, New India Publishing Agency Pvt Ltd, New Delhi, India, 2014.
<b>Web Resource(s):</b>

<b>Course Outcomes</b>		
Upon successful completion of this course, the student will be able to:		
<b>CO No.</b>	<b>CO Statement</b>	<b>Cognitive Level (K-Level)</b>
<b>CO1</b>	Recognize the hypothetical orientation of seed development.	<b>K1</b>
<b>CO2</b>	Explain the principles of seed production technology & its use for flowering and vegetable crops.	<b>K2</b>
<b>CO3</b>	Illustrate the concept of hybrid seed production.	<b>K3</b>
<b>CO4</b>	Examine various methods of seed testing.	<b>K4</b>
<b>CO5</b>	Distinguish seed processing, storage, certification and marketing.	<b>K5</b>

**Relationship Matrix:**

<b>Course Outcomes (COs)</b>	<b>Programme Outcomes (POs)</b>					<b>Programme Specific Outcomes (PSOs)</b>					<b>Mean Score of Cos</b>
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>	
<b>CO1</b>	<b>03</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>02</b>	<b>2.0</b>
<b>CO2</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>2.0</b>
<b>CO3</b>	<b>01</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>03</b>	<b>02</b>	<b>02</b>	<b>2.0</b>
<b>CO4</b>	<b>03</b>	<b>01</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>2.0</b>
<b>CO5</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>03</b>	<b>2.0</b>
<b>Mean Overall Score</b>											<b>2.0</b>
<b>Correlation</b>											<b>Medium</b>

<b>Mean Overall Score</b>	<b>Correlation</b>
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

**Course Coordinator:**

**Dr. N. AHAMED SHERIF**



Semester	Course Code	Course Category	Total Hours	Credits	Marks for Evaluation		
					CIA	ESE	Total
II	23DHO2CC7	General	60	4	25	75	100
Course Title		<b>HORTICULTURAL PRE AND POST - HARVEST PRACTICES</b>					

SYLLABUS		
Unit	Contents	Hours
I	<b>Pre-harvest practice and disease management:</b> Pre-harvest factors affecting quality, factors responsible for deterioration of horticultural products, physiological and bio-chemical changes, hardening and delaying ripening process. Pre-harvest diseases –densifications of deficiency symptoms and nutritional management. *IPM strategies (genetic, biological and chemical methods for pest control)*.	12
II	<b>Post-harvest practices:</b> Overview and importance of post -harvest handling. Principle and methods of preservation and processing. Methods of minimizing loses during storage and transportation; Harvesting and handling of fruits, *cut flowers*, vegetables, herbs, storage tissues and organs.	12
III	<b>Post-harvest processing:</b> Food processing – canning, fruit juice beverages, pickles, jam, jellies, candies, food additives, labeling. Food irradiation and food safety. Importance and advantages of appropriate technologies. Evaluation of quality traits. Harvesting of produce and extent of post-harvest losses. Value addition – standardization and *improvement of quality*.	12
IV	<b>Protection of Post-harvest Produce:</b> Concept of maturity and maturity indices. Pre-harvest quality modifiers, Trimming, cleaning and drying technologies. Post-harvest physiology – Physiological disorders, development, identification and Control. Post-harvest diseases - source of infection, types of diseases, losses by insects. Prevention techniques for post -harvest losses. Storage techniques, *biorational approaches*.	12
V	<b>Post-harvest strategies and transportation:</b> Laws of food selling. Treatments prior to shipment –chlorination, waxing, chemicals, biocontrol agents and. Methods of storage: ventilated, refrigerated, MAS, CA storage, Precooling, sorting, grading, packaging, *transportation and marketing*.	12
VI	<b>Current Trends (For CIA only) –</b> Natural plant products and Crop sanitation and quarantine practices.	

\*.....\* Self Study

<b>Text Book(s):</b>
<ol style="list-style-type: none"> <li>Upadhyaya RC, Post-Harvest Technology of Horticulture crops, 1<sup>st</sup> Edition, Anmol Publication Pvt Ltd, New Delhi, India, 2008.</li> <li>Sharon Pastor S and Straus MC, Post-Harvest Technology of Horticultural Crops, 1<sup>st</sup> Edition, Oxford &amp; IBH Publishing Pvt Ltd, New Delhi, India, 2010.</li> <li>Rathore NS, Mathur GK and Chasta SS, Post-Harvest management and processing of fruits and vegetables, 1<sup>st</sup> Edition, The Energy and Resources Institute, New Delhi, India, 2012.</li> </ol>

<b>Reference Book(s):</b>
1. Sudheer KP and Indira V, Post-harvest Technology of Horticultural Crops, 1st Edition, New India Publishing Agency Pvt Ltd, New Delhi, India, 2007. 2. Prakash K and Chandrababha S, Post-harvest technology and Value Addition of Fruits and Vegetables, 1 <sup>st</sup> Edition, LAP Lambert Academic Publishing, 2020.
<b>Web Resource(s):</b>

<b>Course Outcomes</b>		
Upon successful completion of this course, the student will be able to:		
<b>CO No.</b>	<b>CO Statement</b>	<b>Cognitive Level (K-Level)</b>
<b>CO1</b>	Select competent pre and post-harvest techniques in horticultural crops.	<b>K1</b>
<b>CO2</b>	Summarize the post-harvest problems likely to be confronted.	<b>K2</b>
<b>CO3</b>	Practice the concept of different types of practices for value addition.	<b>K3</b>
<b>CO4</b>	Catergorize evaluate different post-harvest physiology, disease and protection techniques.	<b>K4</b>
<b>CO5</b>	Summarize the tricks of the trade and how to increase the longevity of the produce.	<b>K5</b>

**Relationship Matrix:**

<b>Course Outcomes (COs)</b>	<b>Programme Outcomes (POs)</b>					<b>Programme Specific Outcomes (PSOs)</b>					<b>Mean Score of Cos</b>
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>	
<b>CO1</b>	<b>03</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>02</b>	<b>2.0</b>
<b>CO2</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>1.9</b>
<b>CO3</b>	<b>01</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>03</b>	<b>02</b>	<b>02</b>	<b>2.0</b>
<b>CO4</b>	<b>03</b>	<b>01</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>2.0</b>
<b>CO5</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>03</b>	<b>1.9</b>
<b>Mean Overall Score</b>											<b>1.9</b>
<b>Correlation</b>											<b>Medium</b>

<b>Mean Overall Score</b>	<b>Correlation</b>
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

**Course Coordinator:**

**Dr. N. AHAMED SHERIF**

Semester	Course Code	Course Category	Total Hours	Credits	Marks for Evaluation		
					CIA	ESE	Total
II	23DHO2CC8	General	60	4	25	75	100

Course Title	<b>LANDSCAPE GARDENING AND GREENHOUSE TECHNOLOGY</b>
--------------	--

SYLLABUS		
Unit	Contents	Hours
I	<b>Origin, history and indoor gardening:</b> Introduction, world history of garden, major gardening styles of the world. *Famous Indian gardens*. Indoor gardening – containers, environmental factors, selection of plants, potting media and other aspects.	12
II	<b>Special types of gardens:</b> Formal and informal garden – garden components. Establishment, construction and management of rock, water, marsh, roof, vertical, terrace and temple garden. *Bonsai – origins, kinds and requirements for starting of bonsai*.	12
III	<b>Lawn establishment and its management:</b> Introduction, site selection, land preparation, types of grasses, planting, detaching methods, irrigation, drainage, manures, fertilizers, disease and *pest management*.	12
IV	<b>Construction and components of greenhouse:</b> An overview of different protective cultivation structures. *Construction and composition of a greenhouse*. Types of greenhouse based on covering material, environmental control and shape. Greenhouse cooling – ventilation, roof shading and evaporating cooling systems.	12
V	<b>Greenhouse management:</b> Requirements for planting in green houses –choice of cultivar, bed preparation, medium, micro-irrigation, fertigation and carbon dioxide enrichment. *Green house cultivation of some important ornamentals and vegetables*.	12
VI	<b>Current Trends (For CIA only)</b> – Abiotic and biotic factors affecting greenhouse cultivation and their management.	

\*.....\* Self Study

<b>Text Book(s):</b>
<ol style="list-style-type: none"> <li>1. Manohar KR, Greenhouse technology and management, 2<sup>nd</sup> Edition, B.S. Publishers Pvt Ltd, New Delhi, India, 2007.</li> <li>2. Misra RL and Misra S, Landscape Gardening, 1<sup>st</sup> Edition, Westville Publishing House Pvt Ltd, New Delhi, India, 2012.</li> <li>3. Patil NN, Greenhouse Technology – Management, operations and Maintenance, 1<sup>st</sup> Edition, Universal Prakashan Pvt Ltd, Pune, India, 2016.</li> </ol>
<b>Reference Book(s):</b>
<ol style="list-style-type: none"> <li>1. Tiwari GN, Greenhouse for controlled environment, 1<sup>st</sup> Edition, Alpha Science International Pvt Ltd, United Kingdom, 2003.</li> <li>2. Bhattacharjee SK, Landscape Gardening and Design with Plants, 1<sup>st</sup> Edition, Avishkar Publishers Pvt Ltd, New Delhi, India, 2012.</li> </ol>
<b>Web Resource(s):</b>

<b>Course Outcomes</b>		
Upon successful completion of this course, the student will be able to:		
<b>CO No.</b>	<b>CO Statement</b>	<b>Cognitive Level (K-Level)</b>
<b>CO1</b>	Identify the principle and components of gardening.	<b>K1</b>
<b>CO2</b>	Differentiate various types of gardens according to the philosophy.	<b>K2</b>
<b>CO3</b>	Develop flower arrangement and bio-aesthetic planning.	<b>K3</b>
<b>CO4</b>	Evaluate the basic details of organization and functioning of greenhouse.	<b>K4</b>
<b>CO5</b>	Predict with crop management in greenhouse condition.	<b>K5</b>

**Relationship Matrix:**

<b>Course Outcomes (COs)</b>	<b>Programme Outcomes (POs)</b>					<b>Programme Specific Outcomes (PSOs)</b>					<b>Mean Score of Cos</b>
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>	
<b>CO1</b>	03	02	02	02	02	03	02	02	02	02	<b>2.2</b>
<b>CO2</b>	02	03	02	02	02	02	03	02	02	02	<b>2.2</b>
<b>CO3</b>	02	02	03	02	02	03	02	03	02	02	<b>2.3</b>
<b>CO4</b>	03	02	02	02	03	02	02	02	03	02	<b>2.3</b>
<b>CO5</b>	02	02	03	02	02	02	02	02	02	03	<b>2.3</b>
<b>Mean Overall Score</b>											<b>2.4</b>
<b>Correlation</b>											<b>Medium</b>

<b>Mean Overall Score</b>	<b>Correlation</b>
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

**Course Coordinator:**

**Dr. N. AHAMED SHERIF**

Semester	Course Code	Course Category	Total Hours	Credits	Marks for Evaluation		
					CIA	ESE	Total
II	23DHO2CC9P	Skill	180	6	20	80	100
Course Title		SEED SCIENCE AND TECHNOLOGY – PRACTICAL					

SYLLABUS		
Unit	Contents	Hours
	<p><b><u>List of Practical's</u></b></p> <ol style="list-style-type: none"> <li>1. Germplasm collection of different types of seeds for conservation – Dicot and monocots.</li> <li>2. Seed viability by using Tetrazolium Test.</li> <li>3. Seed moisture analysis.</li> <li>4. Seed constituent's analysis.</li> <li>5. Seed priming for breaking seed dormancy.</li> <li>6. Seed germination studies: Dicots and monocots.</li> <li>7. Synthetic seed preparation by using sodium alginate method.</li> <li>8. Short term and long-term storage of seed – Liquid Nitrogen.</li> </ol>	180

<b>Text Book(s):</b>
<ol style="list-style-type: none"> <li>1. Manohar KR, Greenhouse technology and management, 2<sup>nd</sup> Edition, B.S. Publishers Pvt Ltd, New Delhi, India, 2007.</li> <li>2. Misra RL and Misra S, Landscape Gardening, 1<sup>st</sup> Edition, Westville Publishing House Pvt Ltd, New Delhi, India, 2012.</li> <li>3. Patil NN, Greenhouse Technology – Management, operations and Maintenance, 1<sup>st</sup> Edition, Universal Prakashan Pvt Ltd, Pune, India, 2016.</li> </ol>
<b>Reference Book(s):</b>
<ol style="list-style-type: none"> <li>1. Tiwari GN, Greenhouse for controlled environment, 1<sup>st</sup> Edition, Alpha Science International Pvt Ltd, United Kingdom, 2003.</li> <li>2. Bhattacharjee SK, Landscape Gardening and Design with Plants, 1<sup>st</sup> Edition, Avishkar Publishers Pvt Ltd, New Delhi, India, 2012.</li> </ol>
<b>Web Resource(s):</b>

<b>Course Outcomes</b>		
Upon successful completion of this course, the student will be able to:		
<b>CO No.</b>	<b>CO Statement</b>	<b>Cognitive Level (K-Level)</b>
<b>CO1</b>	Enumerate collection and preserve traditionally important seed varieties for conservation and commercialization.	<b>K1</b>
<b>CO2</b>	Discover viability of seeds by short and long-term storage techniques.	<b>K2</b>
<b>CO3</b>	Analyze the different dormancy types in seeds.	<b>K3</b>
<b>CO4</b>	Choose seed dormancy and its breaking by mechanical and chemical methods.	<b>K4</b>
<b>CO5</b>	Select the importance of artificial seeds and their germination techniques.	<b>K5</b>

**Relationship Matrix:**

<b>Course Outcomes (COs)</b>	<b>Programme Outcomes (POs)</b>					<b>Programme Specific Outcomes (PSOs)</b>					<b>Mean Score of Cos</b>
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>	
<b>CO1</b>	<b>03</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>02</b>	<b>2.0</b>
<b>CO2</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>2.0</b>
<b>CO3</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>01</b>	<b>03</b>	<b>03</b>	<b>02</b>	<b>2.0</b>
<b>CO4</b>	<b>01</b>	<b>03</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>2.0</b>
<b>CO5</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>03</b>	<b>1.9</b>
<b>Mean Overall Score</b>											<b>2.0</b>
<b>Correlation</b>											<b>Medium</b>

<b>Mean Overall Score</b>	<b>Correlation</b>
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

**Course Coordinator:**

**Dr. A. AHAMED SHERIF**

Semester	Course Code	Course Category	Total Hours	Credits	Marks for Evaluation		
					CIA	ESE	Total
II	23DHO2CC10P	Skill	180	6	20	80	100
Course Title		<b>HORTICULTURAL PRE AND POST- HARVEST PRACTICES – PRACTICAL</b>					

SYLLABUS		
Unit	Contents	Hours
	<p><b><u>List of Practical's</u></b></p> <ol style="list-style-type: none"> <li>1. Field visit to some nearby cold-storage facility.</li> <li>2. Handling of post-harvest equipment: Dryers, storage containers and vessels.</li> <li>3. The production process of the marketable products.</li> <li>4. Post-harvest processing – drying and grading.</li> <li>5. Packaging and transport of produce, minimization of damage during packaging of dry fruits / nuts / herbs and herbal products.</li> <li>6. Post-harvest processing for transportation.</li> <li>7. Identification of major conditions responsible for early decay of produce.</li> <li>8. Identification of pathogenic and non-pathogenic reasons of produce spoilage during storage.</li> <li>9. Cold storage techniques for fruits and vegetables.</li> </ol>	<b>180</b>

<b>Text Book(s):</b>
<ol style="list-style-type: none"> <li>1. Manohar KR, Greenhouse technology and management, 2<sup>nd</sup> Edition, B.S. Publishers Pvt Ltd, New Delhi, India, 2007.</li> <li>2. Misra RL and Misra S, Landscape Gardening, 1<sup>st</sup> Edition, Westville Publishing House Pvt Ltd, New Delhi, India, 2012.</li> <li>3. Patil NN, Greenhouse Technology – Management, operations and Maintenance, 1<sup>st</sup> Edition, Universal Prakashan Pvt Ltd, Pune, India, 2016.</li> </ol>
<b>Reference Book(s):</b>
<ol style="list-style-type: none"> <li>1. Tiwari GN, Greenhouse for controlled environment, 1<sup>st</sup> Edition, Alpha Science International Pvt Ltd, United Kingdom, 2003.</li> <li>2. Bhattacharjee SK, Landscape Gardening and Design with Plants, 1<sup>st</sup> Edition, Avishkar Publishers Pvt Ltd, New Delhi, India, 2012.</li> </ol>
<b>Web Resource(s):</b>

<b>Course Outcomes</b>		
Upon successful completion of this course, the student will be able to:		
<b>CO No.</b>	<b>CO Statement</b>	<b>Cognitive Level (K-Level)</b>
<b>CO1</b>	Recognize the pre and post-harvest produce.	<b>K1</b>
<b>CO2</b>	Identify major condition responsible for early decay of produce.	<b>K2</b>
<b>CO3</b>	Select suitable storage methods for pre and post-harvest produces.	<b>K3</b>
<b>CO4</b>	Distinguish how to grade and packaging of produces.	<b>K4</b>
<b>CO5</b>	Select the importance of community cold storage facilities in our country.	<b>K5</b>

**Relationship Matrix:**

<b>Course Outcomes (COs)</b>	<b>Programme Outcomes (POs)</b>					<b>Programme Specific Outcomes (PSOs)</b>					<b>Mean Score of Cos</b>
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>	
<b>CO1</b>	<b>03</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>02</b>	<b>2.0</b>
<b>CO2</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>2.0</b>
<b>CO3</b>	<b>01</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>1.9</b>
<b>CO4</b>	<b>03</b>	<b>01</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>03</b>	<b>02</b>	<b>2.0</b>
<b>CO5</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>02</b>	<b>01</b>	<b>03</b>	<b>1.9</b>
<b>Mean Overall Score</b>											<b>1.6</b>
<b>Correlation</b>											<b>Medium</b>

<b>Mean Overall Score</b>	<b>Correlation</b>
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5	High

**Course Coordinator:**  
**Dr. N. AHAMED SHERIF**



Semester	Course Code	Course Category	Total Hours	Credits	Marks for Evaluation		
					CIA	ESE	Total
<b>II</b>	<b>23DHO2IN</b>	<b>Skill</b>	<b>180</b>	<b>6</b>	<b>--</b>	<b>--</b>	<b>100</b>

<b>Course Title</b>	<b>LANDSCAPE GARDENING AND GREENHOUSE TECHNOLOGY – INTERNSHIP</b>
---------------------	---

SYLLABUS		
Unit	Contents	Hours
	<b>List of Practical's come Internship</b> 1. Field visit to Botanical gardens, to identify the trees, shrubs and other herbaceous vegetation. 2. Principles of designing indoor and outdoor garden. 3. Propagate, raise and maintenance of indoor and outdoor plants. 4. Practicing on preparation and maintenance of bonsai trees. 5. Practices in lawn establishment and maintenance. 6. Identification of pathogenic and non-pathogenic diseases of garden plants and grasses. 7. Practicing on protected cultivation of plants in green, poly and net house.	<b>180</b>

<b>Text Book(s):</b>
1. Manohar KR, Greenhouse technology and management, 2 <sup>nd</sup> Edition, B.S. Publishers Pvt Ltd, New Delhi, India, 2007. 2. Misra RL and Misra S, Landscape Gardening, 1 <sup>st</sup> Edition, Westville Publishing House Pvt Ltd, New Delhi, India, 2012. 3. Patil NN, Greenhouse Technology – Management, operations and Maintenance, 1 <sup>st</sup> Edition, Universal Prakashan Pvt Ltd, Pune, India, 2016.
<b>Reference Book(s):</b>
1. Tiwari GN, Greenhouse for controlled environment, 1 <sup>st</sup> Edition, Alpha Science International Pvt Ltd, United Kingdom, 2003. 2. Bhattacharjee SK, Landscape Gardening and Design with Plants, 1 <sup>st</sup> Edition, Avishkar Publishers Pvt Ltd, New Delhi, India, 2012.
<b>Web Resource(s):</b>

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	CO Statement	Cognitive Level (K-Level)
<b>CO1</b>	Identify the characteristics of various plants suitable for indoor and outdoor plantation along with physical identification.	<b>K1</b>
<b>CO2</b>	Select indoor and outdoor gardens and train lawn establishment and maintenance.	<b>K2</b>
<b>CO3</b>	Examine how to prepare bonsai plants, preserving, watering, pest management, packing and export strategies.	<b>K3</b>
<b>CO4</b>	Estimate and construction of poly, green and net houses and know the control process of regulating temperature, humidity and light.	<b>K4</b>
<b>CO5</b>	Select and grow the commercial vegetable crops through protected cultivation method.	<b>K5</b>

**Relationship Matrix:**

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean Score of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
<b>CO1</b>	03	02	02	01	02	02	02	01	02	02	<b>1.9</b>
<b>CO2</b>	02	03	02	02	01	02	03	02	02	01	<b>2.0</b>
<b>CO3</b>	01	02	03	02	02	02	01	03	02	02	<b>2.0</b>
<b>CO4</b>	03	01	02	01	02	02	02	02	03	02	<b>2.0</b>
<b>CO5</b>	02	02	02	02	02	02	02	02	02	03	<b>2.1</b>
<b>Mean Overall Score</b>											<b>2.0</b>
<b>Correlation</b>											<b>Medium</b>

Mean Overall Score	Correlation
< 1.5	Low
$\geq 1.5$ and < 2.5	Medium
$\geq 2.5$	High

**Course Coordinator: Dr. N. AHAMED AHERIF**