

**SRI VENKATESWARA UNIVERSITY: TIRUPATI****B.VOC HORTICULTURE**

Under CBCS W.E.F.2022-2023

**COURSE STRUCTURE****SEMESTER-V**

S.. NO	Skill / general education	Courses	Title of the paper/course and code	Credi ts per cours e	Hou rs/w eek	Total hours/ course	Marks		
							Internal	External	Tot al
1	Domain Skill Compon ent	CORE-I	Plant Propagation	04	04	60	25	75	100
2		PRACTICAL-1	Plant Propagation	02	03	30	---	50	50
3		CORE-II	Seed Technology	04	04	60	25	75	100
4		PRACTICAL-II	Seed Technology	02	03	30	--	50	50
5		CORE-III	Ornamental Horticulture	04	04	60	25	75	100
6		PRACTICAL-III	Ornamental Horticulture	02	03	30	---	50	50
7		CORE-IV	Commercial Floriculture	04	04	60	25	75	100
8		PRACTICAL-IV	Commercial Floriculture	02	03	30	-----	50	50
9		CORE-V	Dry Land Horticulture	04	04	60	25	75	100
10		PRACTICAL-V	Dry Land Horticulture	02	03	30	-----	50	50
11		CORE-VI	Introduction To Forestry	04	04	60	25	75	100
12		PRACTICAL-VI	Introduction To Forestry	02	03	30	-----	50	50
<b>TOTAL</b>				<b>36</b>			<b>900</b>		

**B.VOC- HORTICULTURE****SEMESTER - V****CORE- I: PLANT PROPAGATION****Learning Outcomes:**

1. Explain various plant propagation structures and their utilization.
2. Understand advantages and disadvantages of vegetative, asexual and sexual plant propagation methods

3. Assess the benefits of asexual propagation of certain economically valuable plants using apomictic and adventive polyembryony.
4. Demonstrate skills related to vegetative plant propagation techniques such as cuttings, layering, grafting and budding.
5. Apply a specific macro-propagation technique for a given plant species.

**Unit –1: Basic concepts of propagation (10h)**

1. Propagation: Definition, need and potentialities for plant multiplication; asexual and sexual methods of propagation - advantages and disadvantages.
2. Propagation facilities: Mist chamber, humidifiers, greenhouses, glasshouses, cold frames, hot beds, poly-houses, phytotrons nursery - tools and implements.
3. Identification and propagation by division and separation: Bulbs, pseudobulbs, corms, tubers and rhizomes; runners, stolon, suckers and offsets.

**Unit – 2: Apomictic in plant propagation (10h)**

1. Apomixis: Definition, facultative and obligate; types – recurrent, non-recurrent, adventitious and vegetative; advantages and disadvantages. 3
2. Polyembryony: Definition, classification, horticultural significance; chimera and bud sport.
3. Propagation of mango, Citrus and Allium using apomictic embryos.

**Unit –3: Propagation by cuttings (10h)**

1. Cuttings: Definition, different methods of cuttings; root and leaf cuttings.
2. Stem cuttings: Definition of stem tip and section cuttings; plant propagation by herbaceous, soft wood, semi hard wood, hard wood and coniferous stem cuttings.
3. Physiological and bio chemical basis of rooting; factors influencing rooting of cuttings; Use of plant growth regulators in rooting of cuttings.

**Unit –4: Propagation by layering (10h)**

1. Layering: Definition, principle and factors influencing layering.
2. Plant propagation by layering: Ground layering – tip layering, simple layering, trench layering, mound (stool) layering and compound (serpentine layering).
3. Air layering technique – application in woody trees.

## **Unit –5: Propagation by grafting and budding**

**(10h)**

1. Grafting: Definition, principle, types, graft incompatibility, collection of scion wood stick, scion-stock relationship, and their influences, bud wood certification; micrografting.
2. Propagation by veneer, whip, cleft, side and bark grafting techniques.
3. Budding: Definition; techniques of 'T', inverted 'T', patch and chip budding.

## **CORE - I: PLANT PROPAGATION - PRACTICAL SYLLABUS**

**(30 H)**

1. Preparation of nursery beds – flat, raised and sunken beds.
2. Propagation through apomictic
3. Propagation by separation and division technique.
4. Propagation by cuttings.
5. Propagation by layering
6. Propagation by grafting.
7. Propagation by budding

## **B.VOC- HORTICULTURE**

### **SEMESTER-V**

## **CORE- 2: SEED TECHNOLOGY**

### **I. Learning outcomes:**

Students at the successful completion of the course will be able to:

1. Explain the causes for seed dormancy and methods to break dormancy.
2. Understand critical concepts of seed processing and seed storage procedures.
3. Acquire skills related to various seed testing methods.
4. Identify seed borne pathogens and prescribe methods to control them.

5. Understand the legislations on seed production and procedure of seed certification.

**Unit -1: Seed dormancy (10h)**

1. Seed and grain: Definitions, importance of seed; structure of Dicot and Monocot seed.
2. Role and goals of seed technology; characteristics of quality seed material.
3. Dormancy: Definition, causes for seed dormancy; methods to break seed dormancy.

**Unit –2: Seed processing and storage (10h)**

1. Principles of seed processing: seed pre-cleaning, precuring, drying, seed extraction; cleaning, grading, pre-storage treatments; bagging and labelling, safety precautions during processing.
2. Seed storage; orthodox and recalcitrant seeds, natural longevity of seeds.
3. Factors affecting longevity in storage; storage conditions, methods and containers.

**Unit –3: Seed testing (10h)**

1. Definition of seed vigour, viability and longevity; seed sampling and equipment; physical purity analysis.
2. Seed moisture – importance – methods of moisture determination.
3. Seed germination tests using paper, sand or soil – standard germination test; TZ test to determine seed viability; seed health testing.

**Unit –4: Seed borne diseases (10h)**

1. A brief account of different seed borne diseases and their transmission.
2. Different seed health testing methods for detecting microorganisms.
3. Management of seed borne diseases; seed treatment methods: spraying and dusting.

**Unit –5: Seed certification (10h)**

1. Objectives - Indian seed Act; seed rules and seed order; new seed policy (1988).
2. Seed Inspector: Duties and responsibilities; classes of seeds, phases of certification standards (i.e., Land requirement, isolation distance) etc.
3. Issue of certificates, tags and sealing; pre and post control check: Genetic purity verification, certification, records and reporting.

## **COURSE -2: SEED TECHNOLOGY PRACTICAL SYLLABUS**

**(30 H)**

1. Determination of physical properties of seeds of 3 select local crops (1 each from cereals, millets, pulses and oil seeds).
2. Breaking seed dormancy in 3 select local crops.
3. Measurement of seed moisture content by O S W A or moisture meter or oven drying method.
4. Seed germination tests and evaluation.
5. Seed vigour - conductivity test.
6. Accelerated ageing tests.
7. Tetrazolium test.
8. Priming and invigoration treatments for improving germination and vigour.
9. Techniques of seed health testing - visual examination of seeds, washing test, incubation methods, embryo count method, seed soak method for the detection of certain seed borne pathogens.
10. Using various types of tools for dusting and spraying pesticides/insecticides.

## **B.VOC- HORTICULTURE**

**SEMESTER - V**

### **CORE-3: ORNAMENTAL HORTICULTURE**

#### **I. Learning Outcomes:**

Max Marks:75

Students at the successful completion of the course will be able to:

1. Acquire a critical knowledge of ornamental gardening and its significance.
2. Identify and explain living and non-living, components in an ornamental garden.
3. Acquire skills on propagation and planting of various ornamental plants.

4. Perform managerial skills related to ornamental gardening.
5. Demonstrate skills of designing and developing ornamental gardens in public places.

**Unit -I: Introduction to Ornamental Horticulture [10h]**

1. History, Definition, scope of gardening, aesthetic values; types of gardens in India.
2. Landscaping, basic principles and basic components.
3. Principles of gardening, garden components.
4. Lawn types, establishment and maintenance; methods of designing rockery and water garden.

**Unit -2: Types Of Ornamental Gardens [10h]**

1. Special types of gardens, trees, their design, their walk-paths, bridges, constructed features.
2. Garden structures - greenhouse, glass house, net house. in landscaping; propagation-planting of shrubs and herbaceous perennials.

**Unit-3: Plants in Ornamental gardens [10h]**

Importance, design values, propagation, planting of following annuals, biennials and perennials:

(a) Climbers (b) Creepers (c) Palms (d) Ferns (e) Grasses (Cacti), (g) Succulents

**Unit-4: Ornamental gardening - public utility [10h]**

1. Cultural operations in ornamental gardens.
2. Bio-aesthetic planning, definition, need; round country planning; urban planning and planting - avenues, educational institutions, villages.
3. Beautifying railway stations, dam sites, hydroelectric stations, colonies, river banks, Planting material for play grounds.

**Unit- 5: Ornamental gardening in residences [10h]**

1. Bottle gardens, terrariums.
2. Vertical gardens, roof gardens.

3. Indoor gardens
4. Culture of art of making bonsai.

### **CORE-3: ORNAMENTAL HORTICULTURE – PRACTICAL SYLLABUS**

**(30 H)**

1. Identification and description of various plants grown in ornamental gardens.
2. Tools, implements and containers used in ornamental gardening.
3. Planning, designing and establishment of garden features viz. lawn, hedge and edge, rockery etc.,
4. Demonstration of types and styles of gardens using photos or videos.
5. Planning, designing and establishment of water garden, carpet bedding, shade garden, roof garden.
6. Preparation of land for lawn and planting.

## **B.VOC- HORTICULTURE**

**SEMESTER - V**

### **CORE- 4: COMMERCIAL FLORICULTURE**

#### **I. Learning Outcomes:**

Students at the successful completion of the course will be able to:

1. Understand the significance of flowers in human life.
2. Acquire skills related to production techniques in floriculture.
3. Explain the breeding techniques of some flowering plants.
4. Demonstrate skills of protected cultivation in floriculture.
5. Perform skills in relation to post-harvest operations in floriculture.

**Unit-I: Basic concepts of floriculture** ( 10 H)

1. Aesthetic, cultural and industrial importance of flowers; domestic and export marketing of flowers.

2. Floriculture - Importance, area and production in Andhra Pradesh and India.

3. Scope and importance of commercial floriculture in A.P., and India.

**Unit-2: Production technology-1** ( 10 H)

“importance, morphology and taxonomy, varieties, climate and soil, seeds and sowing, manuring, irrigation, intercultural operations, diseases and their control, harvesting and yield of following crops:

(a) Rose (b) Chrysanthemum (c) Jasmine

**Unit-3: Production technology-2** ( 10 H)

“importance, morphology and taxonomy, varieties, climate and soil, seeds and sowing, manuring, irrigation, intercultural operations, diseases and their control, harvesting and yield of following crops:

(a)Tuberose (b) Marigold (c) Crossandra (d) Dahlia

**Unit-4: Production technology** ( 10 H)

“importance, morphology and taxonomy, varieties, climate and soil, seeds and sowing, manuring, irrigation, intercultural operations, diseases and their control, harvesting and yield of following crops:

(a) gladiolus (b) gerbera (c) carnation (d) orchids (e) anthurium

**Unit-5: Post-harvest practices in floriculture** ( 10 H)

1. Growing of flowering plants under protected environments such as glass house, plastic house, net house, etc.

2. Importance of flower arrangement; Ikebana - techniques, types, suitable flowers and cut foliage.



3. Postharvest technology of cut and loose flowers in respect of commercial flower crops.
4. Dehydration techniques for drying of flowers, scope importance and status.

### **CORE – 4: COMMERCIAL FLORICULTURE – PRACTICAL SYLLABUS**

1. Identification of commercially important floricultural crops.
2. Propagation technique in Hibiscus/Rose/Chrysanthemum/tuberose.
3. Propagation technique in Gladiolus/ carnation Petunia
4. Sowing of seeds and raising of seedlings of a flowering plant.
5. Training and pruning of rose/Jasminum.
6. Drying and preservation of flowers.
7. Use of chemicals and other compounds for prolonging the vase life of cut flowers.
8. Flower arrangement practices.
9. Preparation of bouquets, garland.

### **B.VOC- HORTICULTURE**

#### **SEMESTER - V**

### **CORE- 5: DRY LAND HORTICULTURE**

#### **I. Learning Outcomes:**

Students at the successful complete on of the course will be able to:

1. Understand the basic concepts of dryland horticulture and its prospects.
2. Acquire skills in relation to management of soil and water in dryland farming.
3. Demonstrate skills on various methods to check the water loss during farming.
4. Understand the cultivation practices of certain crops suitable for dryland farming.

**Unit-1: Introduction to Dryland horticulture**

( 10 H)

- I. Definition, importance and limitation of dry land horticulture.
2. Present status and future scope. Constraints encounter in dry lands.
3. Agroclimatic features in rain shadow areas, scares \ aster resources, high temperature, soil erosion, run-off losses etc.

**Unit -2: Soil and water management**

( 10 H)

- I. Techniques and management of dry land horticulture: watershed development, soil and water conservation methods {terraces, contour bunds, etc.
2. Methods of control and impounding of run-off water-farm ponds, trenches, macro catch pits, etc.
3. in-situ water harvesting methods, micro catchment, different types of tree basins etc.

**Unit-3: Methods for efficient water use**

( 10 H)

1. Methods of reducing evapotranspiration, use of shelter belts, mulches, antitranspirants, Growth regulators, etc.
2. Water use efficiency-need based, economic and conjunctive use of water, Micro systems of irrigation etc. IFS concept and alternate land use systems.
3. in-situ water harvesting methods, micro catchment, different types of tree basins etc.

**Unit-4: Modern methods of irrigation**

( 10 H)

- I. Characters, special adaptation and cultivation practices of following horticultural crops:  
(a) Ber (b) Annona (c) Pomegranate (d) Tamarind

**Unit-5: Water management**

( 10 H)

- I. Characters, special adaptation and cultivation practices of following horticultural crops:  
(a) Fig (b) Wood apple (c) Marking nut (d) Carambola

## **CORE-5: DRY LAND HORTICULTURE – PRACTICAL SYLLABUS**

(30 H)

1. Study of rainfall patterns.
2. Practicing contour bunding and trenching.
3. Studying micro catchments.
4. Studying soil erosion and its control in a dryland area.
5. Study of evapotranspiration and methods to control.
6. Practicing mulching methods.
7. Irrigation systems - Surface, Sub-surface; micro irrigation methods.
8. Study of special techniques of planting and aftercare in dry lands.
9. Study special horticultural practices in dry land plants.
10. Training and pruning in dry land plants.

## **B.VOC- HORTICULTURE**

**SEMESTER-V**

### **CORE – 6: INTRODUCTION TO FORESTRY**

#### **Learning Outcomes:**

On successful completion of this course, the students will be able to:

1. Understand the history and importance of forests and forestry in relation to products and climate.
2. Identify, classify and explain the features of forests in India.
3. Discuss the soils in forests and the process of soil formation.
4. Demonstrate skills on determination of physicochemical characteristics of soil.
5. Explain the biotic and abiotic components of the forest ecosystem.
6. Acquire critical knowledge on methods to estimate primary productivity.

**UNIT - I: Principles of Forestry** **12 H**

1. Forest and Forestry: Definitions, history of forestry.
2. Divisions of forestry and interrelations; forest resources.
3. Importance of forests – Direct and indirect benefits.

**UNIT - II: Forest Types** **12 H**

1. Forest types in India.
2. Forest types in South India.
3. Forests in Andhra Pradesh.

**UNIT – III: Forest Soils** **12 H**

1. Classification of forest soils.
2. Factors effecting soil formation.
3. Physical and chemical properties of soil.

**UNIT – IV: Ecosystems** **12 H**

1. Ecosystem: Definition and components; food chain, food web and ecological pyramids.
2. Biotic components in forests.
3. Abiotic components in forests.

**UNIT - V: Forest Ecology** **12 H**

1. Ecological succession: Definition and process.
2. Climax communities in forests.
3. Primary productivity: Definition and estimation methods.

**CORE- 6: INTRODUCTION TO FORESTRY – PRACTICAL SYLLABUS**

**30 H**

1. Determination of soil moistures of forest soils.

2. Mechanical analysis of soil.
3. Estimation of soil PH.
4. Determination of organic matter in soils.
5. Determination of Nitrogen, Phosphorus, Potassium and Calcium in forest soils.
6. Determination of field capacity of the forest soil.
7. Estimation of primary productivity.
8. Visit to local forest-based industries, GCC and forest department office.