

Sri Venkateswara University, Tirupati

Syllabus for **B.VOC HORTICULTURE (MAJOR)** in consonance with Curriculum framework
w. e. f 2025-26 AY onwards
COURSE STRUCTURE

Year	Semester	Course	Title	No of Hrs/week	No of Credits
I	I	1	Fundamental of Plant Physiology - (P)	3	3
			Fundamental of Plant Physiology - (P)	2	1
		2	Organic farming – (T)	3	3
			Organic farming – (P)	2	1
	II	3	Seed Technology – (T)	3	3
			Seed Technology – (P)	2	1
		4	Silvi Horticulture – (T)	3	3
			Silvi Horticulture – (P)	2	1
II	III	5	Fundamental of Horticulture - (T)	3	3
			Fundamental of Horticulture - (P)	2	1
		6	Introduction to Soil Science – (T)	3	3
			Introduction to Soil Science – (P)	2	1
		7	Management of Pests in Horticultural Crops – (T)	3	3
			Management of Pests in Horticultural Crops – (P)	2	1
	IV	8	Basics of Vegetable Science – (T)	3	3
			Basics of Vegetable Science – (P)	2	1
		9	Plant Tissue Culture – (T)	3	3
			Plant Tissue Culture – (P)	2	1
		10	Management of Diseases in Horticultural Crops – (T)	3	3
			Management of Diseases in Horticultural Crops – (P)	2	1
III	V	11	Basics of Fruit Science – (T)	3	3
			Basics of Fruit Science – (P)	2	1
		12	Plantation crops, Spice crops, Medicinal crops and Aromatic crops – (T)	3	3
			Plantation crops, Spice crops, Medicinal crops and Aromatic crops – (P)	2	1
		13	Mushroom Culture and Technology – (T)	3	3
			Mushroom Culture and Technology – (P)	2	1
		14	Ornamental Horticulture – (T)	3	3
			Ornamental Horticulture – (P)	2	1


P. RAVINDRANATH REDDY
LECTURER IN HORTICULTURE
S.V.C.R Govt. Degree College
Palammaner-517408, Chittoor(Dt)

IV	VI	15	Commercial Floriculture – (T)	3	3
			Commercial Floriculture – (P)	2	1
	VII	16	Plant propagation– (T)	3	3
			Plant propagation– (P)	2	1
		17	Dry land horticulture– (T)	3	3
			Dry land horticulture– (P)	2	1
		18	Processing of horticultural crops– (T)	3	3
			Processing of horticultural crops– (P)	2	1
		19	Weed management of horticultural crops– (T)	3	3
			Weed management of horticultural crops– (P)	2	1
		20	Growth and development of horticultural crops– (T)	3	3
			Growth and development of horticultural crops– (P)	2	1
	VIII	21	Apiculture– (T)	3	3
			Apiculture– (P)	2	1
		22	Introduction to major field crops– (T)	3	3
			Introduction to major field crops– (P)	2	1
		23	Fundamentals of extension education– (T)	3	3
			Fundamentals of extension education– (P)	2	1
		24	Post harvest management of horticultural crops– (T)	3	3
			Post harvest management of horticultural crops– (P)	2	1
		25	Farm power and machinery– (T)	3	3
			Farm power and machinery– (P)	2	1

P. Ravindranath Reddy

P.RAVINDRANATH REDDY
LECTURER IN HORTICULTURE
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Palamaner-517408, Chittoor(Dt)

SEMESTER – I
COURSE 1: FUNDAMENTALS OF PLANT PHYSIOLOGY

Theory

Credits – 3

3 hrs/week

I. Learning Objectives

1. **Understand the basic concepts of plant physiology** and its role in horticultural crop growth, development, and productivity.
2. **Explain water relations in plants** – absorption, conduction, transpiration, and significance of water potential.
3. **Describe mineral nutrition** – essential elements, deficiency symptoms, and their role in plant metabolism.
4. **Analyze photosynthesis** – light and dark reactions, factors affecting photosynthetic rate, and importance in yield improvement.
5. **Understand respiration in plants** – glycolysis, Krebs cycle, electron transport, and energy production.
6. **Explain plant growth and development** – role of meristems, growth phases, and measurement of growth.
7. **Evaluate the role of plant hormones (phytohormones)** in regulating processes like seed germination, flowering, fruit set, and ripening.
8. **Understand photoperiodism and vernalization** in relation to flowering and crop improvement.
9. **Study stress physiology** – how plants respond to biotic and abiotic stresses (drought, salinity, temperature).
10. **Apply plant physiological knowledge** to improve crop management practices such as irrigation, nutrient management, pruning, and post-harvest handling in horticulture.

II. Learning outcome:

- After complete of these courses, students should be able to be
- Understand about objectives of plant
- Physiology Understand about relation
- water and plants
- Role of plants hormones
- Understand about differences between C3, C4, and CAM with examples.
- Learn about definitions, science terminology
- Understand about Seed dormancy Provide hands – on – experience

III. Syllabus of Theory

Unit – 1 Introduction

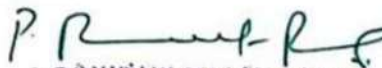
9 hrs.

1. Definition, scope, objectives.
2. Importance of physiology.
3. Morphology of plant, Classification of plants and significance of plants.
4. Differences between monocot and dicot plants.

Unit – 2 Water relations in plants

9 Hrs.

1. Role of water in metabolism.
2. Importance of water in plant life.
3. Role of phloem and xylem water potential, Osmosis, Diffusion.
4. Structure and classification, mechanism of Stomata.
5. Definition and types of transpiration, Factors affecting on transpiration.


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Unit – 3 Mineral nutrition

9 Hrs.

1. Definition, objectives, Classification of nutrition.
2. Essential elements – macro and micronutrients.
3. Role of Nutrients in plant metabolism.
4. Sand/Soil culture and soilless culture (Hydroponics and aeroponics).

Unit – 4 Photosynthesis

9 Hrs.

1. Structure and function of chloroplast and mitochondria.
2. Dark and light reactions, C3 and C4 plants Significance.
3. Factors affecting photosynthesis – light, CO₂, temperature, water.
4. Importance of photosynthesis in crop productivity

Unit – 5 Respiration and plant growth & plant movements and stress Physiology

9 Hrs.

1. Plant growth regulators (Auxins, Gibberellins, Cytokinins, ABA, Ethylene) – role in horticultural practices (fruit ripening, flowering, rooting, etc.).
2. Photoperiodism - short, long and day neutral plants.
3. Definition and classification of stress in plants (a biotic and biotic).

IV. Text Books/ Reference Books:

- Fundamentals of Plant Physiology - Taiz (concise)
- Plant Physiology, Development & Metabolism - Bhatla & Lal
- Fundamentals of Plant Physiology - V.K. Jain
- Objective Plant Physiology - Dwivedi & Kumar
- Plant Anatomy & Physiology - A. Khan
- Plant Physiology - Hans Mohr



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SEMESTER – I
COURSE 1: FUNDAMENTALS OF PLANT PHYSIOLOGY

Practical

Credits – 1

2 hrs/week

I. Laboratory/field exercises:

1. Determination of water potential by potato osmoscope
2. Demonstration of root pressure
3. Measurement of transpiration by cobalt chloride paper method
4. Separation of plant pigments by paper chromatography
5. Demonstration of starch formation in leaves
6. Rate of photosynthesis measurement by Wilmott's bubbler
7. Demonstration of anaerobic respiration (fermentation)
8. Effect of plant hormones (IAA/GA₃/Cytokinins) on seed germination/plant growth
9. Seed germination under light and dark (photoblastic seeds)
10. Effect of drought stress on wilting (demonstration)
11. Effect of salt stress on seed germination (demonstration)
12. Record

II. Suggested Activities

A. Measurable Activities

a. Student Seminars (Presentation topics)

1. Photosynthesis – Light and Dark Reactions (C₃, C₄, CAM pathways)
2. Role of pigments in photosynthesis (chlorophylls, carotenoids, phycobilins)
3. Factors affecting photosynthesis (light, CO₂, temperature, water)
4. Transpiration types and measurement methods (potometer experiment)
5. Mechanism of translocation of organic solutes (Münch's pressure-flow hypothesis)
6. Plant growth regulators (auxins, gibberellins, cytokinins, ABA, ethylene)
7. Photoperiodism and Vernalization
8. Stress physiology in plants (drought, salinity, temperature stress)

b. Student Study Projects (Practical/Field-based)

1. Demonstration of transpiration using cobalt chloride paper or potometer.
2. Comparative study of photosynthesis under different light intensities.
3. Effect of different fertilizers on plant growth and chlorophyll content.
4. Observation of diurnal variation in stomatal opening.
5. Study of wilting in plants and recovery after watering.
6. Field visit to greenhouse to study environmental control for photosynthesis.

c. Assignments (Written/Report topics)

1. Write notes on mineral nutrition in plants and deficiency symptoms.
2. Differentiate between C₃, C₄ and CAM plants with examples.
3. Mechanism of opening and closing of stomata.
4. Functions and commercial applications of plant hormones.
5. Explain photoperiodism with reference to short-day and long-day plants.
6. Write a short essay on translocation of food in plants.
7. Importance of water potential and osmotic relations in plants.
8. Role of micronutrients in horticultural crops.
9. Stress adaptation mechanisms in plants.

MODEL QUESTION PAPER
COURSE 1: FUNDAMENTALS OF PLANT PHYSIOLOGY

Times: 3 Hours

Maximum Marks: 75

SECTION – A

(Answer **ANY FIVE** questions. Each question carries 3 Marks)

(5 × 3 = 15 Marks)

1. Definition of physiology
2. Scope of physiology
3. Osmosis
4. Diffusion
5. Definition of nutrition
6. Objectives of nutrition
7. Structure of mitochondria
8. Function of chloroplast
9. Classification of stress
10. Gibberellins

SECTION – B

(Answer any **ONE** question from each Unit. Each question carries 12 Marks) **(5 × 12 = 60 Marks)**

UNIT – I

11. A. Classification of plants and significance of plants?

OR

- B. Differences between monocot and dicot plants?

UNIT – II

12. A Role of phloem and xylem?

OR

- B. Describe the types of transpiration and Factors affecting on transpiration?

UNIT – III

13. A .Role of Nutrients in plant metabolism?

OR

- B. Explain Soil culture and soilless culture?

UNIT – IV

14. A. Factors affecting photosynthesis light, CO₂?

OR

- B. C₃ and C₄ plants Significance?

UNIT – V

15. A. Photoperiodism - short, long and day neutral plants?

OR

- B. Plant growth regulators Gibberellins, role in horticultural practices?