



ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION

Syllabus for **B.VOC HORTICULTURE (MAJOR)** in consonance with Curriculum framework

(W.E.F. AY-2026-27)

COURSE STRUCTURE (for Semester III)

Year	Semester	Course	Title	No of Hrs/week	No of Credits
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


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SEMSTER - III
COURSE - 6: INTRODUCTION TO SOIL SCIENCE

Theory

Credits – 3

3 hrs/week

I. Learning objectives

1. **Explain the origin and formation of soils** through weathering processes and soil profile development.
2. **Identify soil physical properties** such as texture, structure, color, porosity, and bulk density, and their significance in plant growth.
3. **Recognize soil chemical properties**, including pH, cation exchange capacity, salinity, and nutrient availability.
4. **Describe soil biological properties**, focusing on soil microorganisms, organic matter, and their roles in nutrient cycling.
5. **Classify soils** based on their horizon characteristics, soil taxonomy, and agro-climatic conditions.
6. **Assess soil fertility and productivity**, and understand essential plant nutrients and their deficiency symptoms.
7. **Apply soil conservation and management practices** to prevent erosion, salinity, and degradation for sustainable horticultural production.

II. Learning Outcome:

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

1. Understand basic principles of Soil science
2. Understand the soil formation, soil profile, and soil physical properties
3. Understand the elementary knowledge of soil taxonomy
4. Understands the problematic soils and their management
5. Understand soil organic matter composition and its influence on soil microorganisms

III. Syllabus of Theory

Unit - 1: Introduction

9 Hrs

1. Definition of Soil, Soil profile
2. Different types of soils
3. Soil as Natural Body
4. Soil components – inorganic, organic, soil air, and soil water

Unit - 2: Physical properties

9 Hrs

1. Soil texture, Soil structure: types and significance
2. Bulk density, particle density.
3. Soil color and its importance
4. Soil temperature – factors affecting, measurement

Unit - 3: Morphology of colloids & biological properties of soil

9 Hrs

1. Chemistry of clays, ionic exchange, acidity, alkalinity, pH.
2. Soil organic matter, C: N relations, N transformations
3. Soil structure: types and significance
4. Soil health.


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Unit – 4: soil fertility and fertilizers

9 Hrs

1. Soil Essential elements, soil fertility evaluation techniques.
2. Factors affecting soil fertility. Importance of soil fertility.
3. Soil testing methods and soil fertilizers.
4. Soil Micro nutrient fertilizers and their quality.

Unit - 5: Soil and Water Conservation in Horticulture

9 Hrs

1. Soil erosion: types, causes, and control measures
2. Soil conservation practices (terracing, mulching, cover crops)
3. Soil organic matter management and composting
4. Importance of soil testing in horticulture

IV. Reference books:

- a. The Soil: A Natural Resource: tapas bhattacharyya and d.k. pal
- b. Soil physical properties. v.k. phogat, v.s. tomar and rita dahiya
- c. Soil water and its management. anil kumar singh and s.k. chaudhari
- d. Soil erosion and conservation. s.s. kukal and m.j. singh
- e. Soil, water and air pollution. h. pathak, k.m. manjaiah and prem dureja


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SEMSTER - III
COURSE - 6: INTRODUCTION TO SOIL SCIENCE

Practical

Credits – 1

2 hrs/week

I. Laboratory/field exercises:

1. Soil sampling procedures for field and horticultural crops.
2. Collection and preparation of soil samples for analysis
3. Determination of soil texture by feel method and hydrometer method
4. Study of soil color using Munsell color chart
5. Determination of N, P and K of the soil.
6. Measurement of soil pH and electrical conductivity
7. Demonstration of soil moisture determination (gravimetric method)
8. Determination of organic carbon in soils
9. Isolation of common soil microorganisms (bacteria, fungi)
10. Demonstration of nitrogen fixation by Rhizobium in leguminous roots
11. Demonstration of mycorrhizal association in plant roots
12. Visit to soil testing laboratory / demonstration of soil health card preparation

II. Suggested activities and evaluation methods:

Measurable Activities

1. Student Seminars (Presentation Topics)

- Soil as a natural body: components and functions.
- Soil formation factors and processes.
- Soil profile and horizons.
- Soil texture, structure, and their importance in horticulture.
- Soil organic matter and its role in fertility.
- Essential plant nutrients and their classification.
- Soil pH and nutrient availability.
- Soil testing methods and interpretation of results.
- Soil erosion and conservation methods in horticulture.
- Role of soil microbes in nutrient cycling.

2. Student Study Projects (SSPs)

- Comparative study of soil types in the local area (red soil, black soil, alluvial soil, laterite soil).
- Soil fertility mapping of college farm fields.
- Effect of organic amendments (FYM, compost, vermicompost) on soil properties.
- Soil pH analysis and its influence on crop growth.
- Water holding capacity studies of different soil textures.
- Study of microbial population in rhizosphere soils.
- Impact of mulching on soil moisture and temperature in horticultural crops.
- Demonstration of soil erosion control methods (mulching, bunding, cover cropping).

3. Assignment Topics

- Importance of soil science in horticulture.
- Difference between soil and rock.
- Soil texture classes and their horticultural significance.
- Soil fertility vs. soil productivity.
- Role of macro and micronutrients in plant growth.

MODEL QUESTION PAPER
COURSE - 6: INTRODUCTION TO SOIL SCIENCE

Times: 3 Hours

Maximum Marks: 75

SECTION - A

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

(5 × 3 = 15 Marks)

1. Explain the main layers of a soil profile.
2. Major components of soil.
3. What is soil texture?
4. Write short notes on bulk density
5. What is soil pH?
6. Define soil organic matter
7. Name any five essential elements required for plant growth.
8. What is soil testing?
9. What is soil erosion? Mention its main causes.
10. Mulching and its role in soil conservation.

SECTION - B

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

UNIT - I

11. A. Explain the Different types of soils

OR

- B. Soil components -- inorganic, organic, soil air, and soil water

UNIT - II

12. A. Explain soil texture and structure.

OR

- B. Explain the Soil temperature -- factors affecting, measurement

UNIT - III

13. A. Describe the chemistry of clays and explain cation exchange?

OR

- B. Discuss the C: N ratio, and nitrogen transformation in maintaining

UNIT - IV

14. A. Explain the essential elements required for plant growth.

OR

- B. Discuss soil testing methods and describe various types of fertilizers.

UNIT - V

15. A. Define soil erosion and explain its types, causes, and various control measures?

OR

- B. Explain the importance of soil testing in horticulture.

4- Year UG Honours, Major
Syllabus
(2026-27)
Semester-III

Model Question Paper

Time : 3hrs

Marks:75

Part-A

Answer any Five Questions. Each Question carries 3 Marks.

5x3=15

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

Answer the following questions. Each question carries 12 Marks

5x12=60

11. a) Unit-I
(Or)
b) Unit-I

12. a) Unit-II
(Or)
b) Unit-II

13. a) Unit-III
(Or)
b) Unit-III

14. a) Unit-IV
(Or)
b) Unit-IV

15. a) Unit-V
(Or)
b) Unit-V