

Government College (Autonomous), Rajamahendravaram
I B.Sc., (Hons.) Organic Farming - Semester- I
Core Course-1: AGRICULTURAL BOTANY

Theory

Credits: 3

3 Hrs./week

I. Learning Objective: By the end of this course the learner has to:

1. Understand the principles of plant classification and their relevance to agricultural crops.
2. Describe the structural organization of various economically valuable plants.
3. Recognize botanical features and agronomic significance of major cereal, pulse, and oilseed crops.
4. Realize the botanical diversity and economic value of vegetable, fruit, and plantation crops.
5. Understand the botanical features and economic relevance of spices, medicinal, aromatic, and fodder crops.

II. Learning Outcome: On completion of this course students will be able to:

1. Explain the classification systems and identify key agricultural families and their characteristics.
2. Differentiate and label the anatomical structures in various plant organs
3. Distinguish the cereal, pulse, and oilseed crops based on key morphological and botanical characteristics.
4. Identify and classify common vegetable, fruit, and plantation crops based on their botanical features.
5. Analyze the roles and distinguishing features of economically valuable spices, medicinal, aromatic, and fodder crops.

III. Syllabus:

Unit I: Introduction to Agricultural Botany

8 Hrs

1. Definition, scope, and importance of agricultural botany; branches of agricultural botany
2. History and contributions of plant taxonomy to agriculture
3. Systems of classification (artificial, natural, phylogenetic); Bentham and Hooker's classification; brief account of APG-IV
4. Binomial nomenclature, Herbarium techniques

Unit-2: Morphology of Plants

9 Hrs

1. Morphology, types and modifications of root, stem, leaf.
2. Types of inflorescences, structure and parts of a flower.
3. Types and structure of fruits, and seeds

Unit-3: Field crops

10 Hrs

Origin, systematic position, Botanical description, chromosome number and economic importance of:

1. Cereals: Rice, Wheat, Maize, Barley, Sorghum
2. Pulses: Chickpea, Pigeon pea, Lentil, Mung bean, Black gram
3. Oilseeds: Mustard, Groundnut, Soybean, Sunflower, Sesame

Unit-4: Horticultural crops

9Hrs

Origin, systematic position, Botanical description, chromosome number and economic importance of:

1. Vegetables: Tomato, Brinjal, Chilli, Onion, Potato, Carrot, Cabbage
2. Fruit crops: Mango, Banana, Citrus, Guava, Papaya, Grapes
3. Plantation crops: Coconut, Arecanut, Coffee, Tea, Rubber

Unit-5: Spices and Aromatic crops**9Hrs**

Origin, systematic position, Botanical description, chromosome number and economic importance of:

1. Spices: Turmeric, Ginger, Cardamom, Clove, Black Pepper
2. Medicinal and aromatic plants: Tulsi, Ashwagandha, *Aloe vera*, Lemongrass, Mint
3. Fodder crops: Berseem, Napier, Lucerne, Sorghum (fodder types), Cowpea

IV. Text Books:

1. Singh, V., Pandey, D.K. & Jain, D.K. (2018). *A Textbook of Botany – Angiosperms*. S. Chand & Company Ltd., New Delhi.
2. Bhojwani, S.S. & Bhatnagar, S.P. (2014). *The Embryology of Angiosperms*. Vikas Publishing House, New Delhi.
3. Pandey, B.P. (2016). *Plant Anatomy*. S. Chand & Company Ltd., New Delhi.

V. Reference Books:

1. Strasburger, E., Noll, F., Schenck, H. & Schimper, A.F.W. (2012). *Strasburger's Textbook of Botany*. Longman, London.
2. Simpson, M.G. (2019). *Plant Systematics*. Academic Press, Elsevier.
3. Judd, W.S., Campbell, C.S., Kellogg, E.A., Stevens, P.F. & Donoghue, M.J. (2016). *Plant Systematics: A Phylogenetic Approach*. Sinauer Associates.
4. Mauseth, J.D. (2014). *Botany: An Introduction to Plant Biology*. Jones & Bartlett Learning.

VI. Suggested Activities and Evaluation Methods:

Unit-1: Activity: Preparation of a short report on different systems of plant classification (Bentham & Hooker vs APG-IV).

Evaluation Method: Assessment of conceptual clarity, organization, and accuracy using a rubric.

Unit-2: Activity: Collection and observation of modified roots, stems, and leaves from local plants.

Evaluation Method: Evaluation based on identification accuracy, sketches, and explanation.

Unit-3: Activity: Preparation of a comparative chart of cereals, pulses, and oilseeds highlighting botanical characters.

Evaluation Method: Assessment based on completeness, correctness, and presentation.

Unit-4: Activity: Field visit to local vegetable gardens / orchards to record botanical features of horticultural crops.

Evaluation Method: Evaluation of field visit report and observations.

Unit-5: Activity: Herbarium preparation of at least five species belonging to spices, medicinal, aromatic, or fodder crops.

Evaluation Method: Assessment based on specimen quality, labeling, and documentation.

COs / PLOs	PLO-1	PLO-2	PLO-3	PLO-4	PLO-5	PLO-6	PLO-7	PLO-8	PLO-9	PLO-10
CO-1	3	2	2	–	–	–	2	2	2	2
CO-2	3	3	2	–	–	–	2	2	2	–
CO-3	3	3	3	2	–	–	2	2	2	2
CO-4	3	2	2	3	2	–	2	2	3	3
CO-5	3	2	2	3	2	2	2	2	3	3

(3 = High, 2 = Moderate, 1 = Low, - = No direct correlation)

Semester-I/ Core Course-1: Agricultural Botany

Practical

Credits: 1

2 Hrs./week

I. Course Outcomes: On successful completion of this practical course, student shall be able to:

1. Observe, identify, and describe morphological and anatomical features of agricultural plants.
2. Prepare and examine temporary slides, floral diagrams, and herbarium specimens following standard botanical procedures.
3. Identify crop plants and plant families based on diagnostic botanical characters.

II. Laboratory / Field Exercises:

1. Study of external morphology of major field crops (cereals, pulses, oilseeds, fibre and sugar crops) with emphasis on diagnostic characters.
2. Examination of root, stem, and leaf types and modifications using fresh specimens.
3. Microscopic study of dicot and monocot root anatomy using permanent and temporary slides.
4. Microscopic study of dicot and monocot stem anatomy using permanent and temporary slides.
5. Microscopic study of dicot and monocot leaf anatomy using permanent and temporary slides.
6. Study of types of inflorescences and floral structures of selected agricultural crops.
7. Identification of economically important plant families based on floral characters: Poaceae, Fabaceae, Brassicaceae, Malvaceae, Solanaceae.
8. Preparation of floral formulae and floral diagrams for representative crop plants.
9. Identification and classification of seeds and fruits of major field and horticultural crops.
10. Study of types of germination (epigeal and hypogeal) using selected crop seeds.
11. Examination of vegetative propagation structures (rhizomes, corms, bulbs, stolons, runners, tubers).
12. Preparation of herbarium specimens of crop plants, including pressing, drying, mounting, labeling, and preservation.
13. Field visit to observe crop diversity, plant families, and adaptive morphological features in agricultural fields.

Core Course-2: INTRODUCTORY AGRONOMY

Theory

Credits: 3

3 hrs./week

I. Learning Objectives: By the end of this course the learner has to:

1. Understand the basic concepts of agronomy, crop classification, and the factors influencing crop growth.
2. Gain knowledge of tillage practices essential for crop production.
3. The role of water and weed management in enhancing crop yield.
4. Understand various cropping systems and approaches to sustainable agriculture.
5. Learn the concepts and techniques, and modern tools for precision farming.

II. Course Outcomes: On completion of this course students will be able to:

1. Explain agronomic principles and classify crops based on various criteria, identifying the major factors influencing crop productivity.
2. Identify, and recommend appropriate tillage and soil management practices.
3. Recommend suitable irrigation methods and effective weed control measures for different crops.
4. Design sustainable and integrated farming systems tailored to different agro-climatic zones.
5. Apply modern tools and techniques in precision farming.

III. Syllabus of Theory:

Unit-1: Introduction to Agronomy and Crop Production

8Hrs

1. Agriculture: Definition, history and evolution; Agronomy: Definition, scope, and importance.
2. Classification of crops based on season, use, and life cycle.
3. Factors affecting crop production (climatic, edaphic, biotic, and physiographic).
4. Farming systems: types and characteristics (subsistence, commercial, mixed, etc.)
5. Integrated farming systems- components, resource use efficiency and optimization techniques.

Unit-2: Tillage Practices

9Hrs

1. Tillage: objectives and factors influencing tillage; soil consistence.
2. Tillage mechanics and types; tillage systems, factors influencing preparatory tillage.
3. Tillage implements; modern tillage practices.
4. Soil-water-plant relationships; irrigation efficiencies, water use efficiencies.
5. Soil erosion, estimation of soil loss; soil conservation and management

Unit-3: Water and Weed Management

9Hrs

1. India water resources; importance of irrigation and drainage.
2. Methods of irrigation (surface, subsurface, sprinkler, drip).
3. Factors influencing crop water requirements; scheduling and efficiency of irrigation.
4. Weeds: classification, life cycle, and harmful effects.
5. Weed control methods: cultural, mechanical, chemical, and biological.

Unit-4: Cropping Systems and Sustainable Agriculture

10 Hrs

1. Principles and types of cropping systems: mono, multiple, relay, intercropping 2. Efficient cropping systems and their evaluation; crop rotation and its significance.
2. Crop diversity, choice of crops and varieties; sequence cropping.
3. Problems and impact on agriculture; indicators of agricultural sustainability.
4. Conservation agriculture; sustainable agriculture practices and resource conservation.

Unit-5: Precision Farming

9 Hrs

1. Precision farming- concept and techniques; steps in precision farming.
2. Status, scope and economic viability of precision farming in India.
3. Geo-informatics: Components and techniques; its role in precision farming.
4. Remote sensing concept and applications in agriculture.
5. Nanotechnology: Definition, concepts and techniques; use of nanotechnology in Agriculture.

IV. Text Books:

1. Reddy, S.R. (2016). Principles of Agronomy. Kalyani Publishers, New Delhi.
2. Panda, S.C. (2018). Agronomy: Fundamentals and Practices. Agrobios (India), Jodhpur.
3. Palaniappan, S.P. & Annadurai, K. (2014). Organic Farming: Principles and Practices. Scientific Publishers, Jodhpur.

V. Reference Books:

1. Gomez, K.A. & Gomez, A.A. (1984). Statistical Procedures for Agricultural Research. John Wiley & Sons.
2. Brady, N.C. & Weil, R.R. (2017). The Nature and Properties of Soils. Pearson Education.
3. Singh, G.B. (2015). Agronomy. Oxford & IBH Publishing Co., New Delhi.
4. FAO Manuals on Sustainable Agriculture and Water Management.

VI. Suggested activities and evaluation methods:

Unit–1: Activity: Preparation of a chart showing classification of crops and factors affecting crop growth.

Evaluation method: Assessment based on accuracy and clarity (rubric-based).

Unit–2: Activity: Field observation of tillage implements and soil conservation practices.

Evaluation method: Evaluation of field notes and participation.

Unit–3: Activity: Case study on irrigation methods and weed management practices in local farms.

Evaluation method: Assessment of report and problem-solving ability.

Unit–4: Activity: Design of a model cropping system suitable for a given agro-climatic zone.

Evaluation method: Evaluation based on logic, sustainability, and presentation.

Unit–5: Activity: Seminar or poster presentation on precision farming tools (GIS, remote sensing, drones).

Evaluation method: Assessment based on content, understanding, and communication skills.

COs / PLOs	PLO-1	PLO-2	PLO-3	PLO-4	PLO-5	PLO-6	PLO-7	PLO-8	PLO-9	PLO-10
CO-1	3	2	2	–	–	–	2	2	2	2
CO-2	3	3	2	2	–	–	2	2	2	–
CO-3	3	3	3	2	–	–	2	2	2	2
CO-4	3	2	2	3	2	–	2	2	3	3
CO-5	3	2	2	3	2	2	2	2	3	3

(3 = High, 2 = Moderate, 1 = Low, – = No direct correlation)

Semester-I/Core Course-2: INTRODUCTORY AGRONOMY

Practical

Credits: 1

2 hrs./week

I. Course Outcomes: On successful completion of this practical course, student shall be able to:

1. Identify and explain basic agronomic practices related to crop production.
2. Handle and demonstrate tillage implements, irrigation methods, and weed management practices.
3. Analyze cropping systems and sustainable agronomic practices under field conditions.

II. Laboratory / Field Exercises:

1. Identification and classification of crops based on season, life cycle, and economic use.
2. Study of important tillage implements (primary and secondary tillage) and their field applications.
3. Demonstration of different tillage operations and assessment of soil tilth under different conditions.
4. Study of soil moisture measurement methods and irrigation scheduling concepts.
5. Identification and demonstration of methods of irrigation: Surface irrigation, Sprinkler irrigation, Drip irrigation
6. Calculation of water use efficiency and irrigation efficiency using field data (numerical problems).
7. Identification of common weeds of field and horticultural crops and classification based on morphology and life cycle.
8. Demonstration of weed control methods: cultural, mechanical, chemical, and biological methods.
9. Study of cropping systems: monocropping, intercropping, mixed cropping, and crop rotation through field examples.
10. Preparation of a cropping system plan suitable for a given agro-climatic zone.
11. Field observation of soil conservation measures and erosion control practices.
12. Exposure visits to farms practicing integrated farming systems or sustainable agriculture practices and submission of a field report.

Government College (Autonomous), Rajamahendravaram
I B.Sc., (Hons.) Organic Farming - Semester- II
Core Course-3: BASIC CONCEPTS OF SOIL SCIENCE

Theory

Credits: 3

3 hrs./week

I. Learning Objectives: By the end of this course the learner has to:

1. To present the scientific basis of soil formation, soil constituents, and the fundamental physical, chemical, and biological properties governing soil behaviour.
2. To describe soil texture, structure, density, porosity, consistency, plasticity, and other physical characteristics influencing aeration, water retention, and root penetration.
3. To outline soil chemical properties, including colloids, ion exchange, soil reaction, buffering, salinity, and nutrient dynamics.
4. To explain soil biological components such as microorganisms, organic matter decomposition, nutrient cycling processes, and their role in soil fertility.
5. To provide a framework for classification of soils, diagnostic horizons, soil survey procedures, and the distribution of major soil groups in India.

II. Course Outcomes: On completion of this course students will be able to:

1. Students will be able to describe soil formation processes, soil profile features, and the influence of parent material, climate, biota, topography, and time.
2. Students will be able to identify soil texture, structure, consistency, and other physical properties using standard field and laboratory methods.
3. Students will be able to explain soil chemical reactions, ion exchange processes, nutrient availability, and soil acidity-alkalinity relationships.
4. Students will be able to describe the biological composition of soils, including microbial groups, organic matter transformations, and nutrient cycling mechanisms.
5. Students will be able to classify soils based on diagnostic horizons and explain the characteristics of major soil orders and important soil groups of India.

III. Syllabus of Theory:

UNIT I: ORIGIN, FORMATION AND CLASSIFICATION OF SOILS - 9Hrs

1. Soil as a natural body - definition, composition, phases of soil, and distinguishing characteristics that differentiate soil from parent rock.
2. Soil genesis - factors of soil formation including climate, organisms, parent material, topography, and time, along with the processes of weathering and pedogenesis.
3. Soil-forming processes - detailed description of addition, loss, translocation, and transformation processes responsible for horizon development.
4. Soil profile - horizon identification, morphological features, and diagnostic properties used for describing and classifying soils.
5. Basics of soil classification - major concepts of Soil Taxonomy and FAO/WRB classification systems, and broad groupings of Indian soils.

UNIT II: PHYSICAL PROPERTIES OF SOIL – 9Hrs

1. Soil texture - particle-size composition, textural classes, and significance of sand, silt, and clay fractions in determining soil behaviour.
2. Soil structure - types of aggregates, grades, classes, structural stability, and factors influencing structural development.
3. Soil density and porosity - bulk density, particle density, total porosity, and their role in soil aeration, root growth, and water movement.

4. Soil colour, consistency, and plasticity - methods of determination and their implication for soil classification and land-use decisions.
5. Soil temperature - factors affecting soil heat regime and its influence on plant growth and microbial activity.

UNIT III: SOIL WATER AND ITS BEHAVIOUR– 9Hrs

1. Soil water retention - types of soil water, soil moisture constants, and concepts of field capacity, permanent wilting point, and available water capacity.
2. Movement of water in soil - saturated and unsaturated flow, infiltration, percolation, hydraulic conductivity, and capillarity.
3. Soil-water-plant relationship - water uptake mechanisms, water potential components, and soil moisture characteristics influencing crop growth.
4. Irrigation water quality - criteria, salinity and sodicity hazards, and classification of irrigation waters.
5. Soil moisture measurement - principles of gravimetric, tensiometric, neutron probe, and dielectric methods.

UNIT IV: CHEMICAL PROPERTIES AND SOIL COLLOIDS– 9Hrs

1. Soil reaction - pH concept, factors influencing soil acidity and alkalinity, and significance for nutrient availability and crop growth.
2. Salt-affected soils - characteristics of saline, sodic, and saline-sodic soils, their formation processes, and basic principles of reclamation.
3. Soil colloids - types, surface properties, adsorption phenomena, and differences between inorganic and organic colloids.
4. Cation exchange and anion exchange - cation exchange capacity (CEC), exchangeable bases, base saturation, and factors influencing exchange reactions.
5. Buffering capacity - mechanisms involved and its importance in soil fertility management.

UNIT V: SOIL ORGANIC MATTER, BIOLOGY, AND NUTRIENT TRANSFORMATIONS– 9Hrs

1. Soil organic matter - composition, decomposition processes, humus formation, and functions related to soil structure, nutrient supply, and biological activity.
2. Soil organisms - classification, characteristics, and roles of bacteria, fungi, actinomycetes, algae, protozoa, earthworms, and nematodes in soil processes.
3. Nutrient cycles - detailed steps of nitrogen, phosphorus, sulfur, and carbon cycles, with emphasis on microbial transformations and environmental influences.
4. Soil enzymes and biological indicators - types, functions, and their role in assessing soil quality and nutrient turnover.
5. Soil fertility and productivity - fundamental concepts, limiting factors, nutrient availability, and principles governing nutrient supply to plants.

IV. Text Books:

1. Brady, N.C. & Weil, R.R. (2017). *The Nature and Properties of Soils*. Pearson Education.
2. Biswas, T.D. & Mukherjee, S.K. (2015). *Textbook of Soil Science*. Tata McGraw-Hill, New Delhi.
3. Panda, S.C. (2018). *Fundamentals of Soil Science*. Agrobios (India), Jodhpur.

V. Reference Books:

1. Miller, R.W. & Donahue, R.L. (2001). *Soils: An Introduction to Soils and Plant Growth*. Prentice Hall.
2. Sehgal, J.L. (2013). *Soil Resource Mapping of India*. NBSS & LUP, Nagpur.
3. White, R.E. (2013). *Principles and Practice of Soil Science*. Wiley-Blackwell.

4. ICAR Manuals on Soil Survey, Soil Classification, and Soil Testing.

VI. Suggested Activities and Evaluation Methods:

Unit-I: Activity: Preparation of charts on soil formation factors and soil profile horizons.

Evaluation: Rubric-based assessment.

Unit-II: Activity: Field identification of soil texture and structure.

Evaluation: Observation and practical notes.

Unit-III: Activity: Case study on irrigation water quality and crop suitability.

Evaluation: Report assessment.

Unit-IV: Activity: Demonstration of soil pH, EC, and colloidal behavior.

Evaluation: Accuracy and interpretation.

Unit-V: Activity: Diagrammatic representation of nutrient cycles and soil food web.

Evaluation: Conceptual clarity and correctness.

COs / PLOs	PLO-1	PLO-2	PLO-3	PLO-4	PLO-5	PLO-6	PLO-7	PLO-8	PLO-9	PLO-10
CO-1	3	2	2	–	–	–	2	2	2	2
CO-2	3	3	2	2	–	–	2	2	2	–
CO-3	3	3	3	2	–	–	2	2	2	2
CO-4	3	2	2	3	2	–	2	2	3	3
CO-5	3	2	2	3	2	2	2	2	3	3

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Government College (Autonomous), Rajamahendravaram
I B.Sc., (Hons.) Organic Farming - Semester- II
Core Course-3: BASIC CONCEPTS OF SOIL SCIENCE

Practical

Credits: 1

2 hrs./week

I. Course Outcomes: On successful completion of this practical course, student shall be able to:

1. Identify soil-forming rocks, minerals, and soil profile features using standard field methods.
2. Determine important physical and chemical properties of soils using laboratory techniques.
3. Collect, process, and handle soil samples systematically for soil analysis and interpretation.

II. Laboratory / Field Exercises:

1. Study of soil-forming rocks and minerals using hand specimens and visual diagnostic characteristics.
2. Examination of soil profile layers using field pits or profile charts and identification of master soil horizons.
3. Determination of soil texture using the feel method and interpretation with the soil textural triangle.
4. Measurement of bulk density and particle density using core sampler and pycnometer methods.
5. Calculation of soil porosity and interpretation of pore-space distribution in relation to aeration and water retention.
6. Observation and recording of soil colour using the Munsell colour chart for diagnostic interpretation.
7. Determination of soil pH using glass electrode or portable pH meter and classification of soil reaction.
8. Measurement of electrical conductivity (EC) of soil extracts and assessment of soil salinity status.
9. Estimation of soil organic carbon using the Walkley–Black wet oxidation method.
10. Determination of soil moisture constants (field capacity and wilting point) using laboratory or field methods.
11. Study of soil colloids and demonstration of flocculation and dispersion behaviour in different soil samples.
12. Collection, preparation, labelling, and storage of soil samples following standard soil sampling protocols.

Government College (Autonomous), Rajamahendravaram
I B.Sc., (Hons.) Organic Farming - Semester- II
Core Course-4: PRINCIPLES OF ORGANIC FARMING

Theory

Credits: 3

3 Hrs./week

I. Learning Objectives: By the end of this course the learner has to:

1. Understand the principles, philosophy, and regulatory frameworks governing organic farming systems.
2. Describe the soil, crop, ecological, and farm components of organic production systems.
3. Explain soil fertility management, nutrient recycling, and organic input use under certified organic standards.
4. Understand non-chemical pest, disease, and weed management strategies in organic farming.
5. Acquire knowledge of organic certification procedures, documentation, inspection, and quality assurance systems.

II. Course Outcomes: On completion of this course students will be able to:

1. Explain the concepts, principles, and development of organic farming and its regulatory frameworks.
2. Describe soil fertility enhancement and nutrient recycling practices in organic systems.
3. Explain organic crop production practices including seed selection, rotations, mulching, and water management.
4. Apply biological and cultural plant protection strategies and distinguish permitted and prohibited inputs.
5. Demonstrate understanding of certification procedures, documentation, labeling, and marketing of organic produce.

III. Syllabus of Theory

Unit-I: Concept and Principles of Organic Farming — 8 Hrs.

1. Organic farming: definition, philosophy, historical evolution, and relevance to sustainability.
2. Principles of organic farming: health, ecology, fairness, and care.
3. Comparison of organic, natural, conventional, and integrated farming systems.
4. Global and Indian organic farming scenario: area, production, major crops, markets.

Unit-II: Soil Fertility Management in Organic Farming — 9 Hrs.

1. Soil organic matter dynamics, humus formation, and soil biological activity.
2. Organic nutrient sources: FYM, compost, green manures, vermicompost, oilcakes, biofertilizers, permitted minerals.
3. Green manuring, crop residue recycling, biomass utilization, and carbon management.
4. Soil health indicators and long-term impacts of organic practices.

Unit-III: Organic Crop Production Practices — 9 Hrs.

1. Crop and variety selection for organic farming; principles of organic seed production.
2. Crop rotation, intercropping, diversified and companion cropping systems.
3. Land preparation, sowing, mulching, nursery management, and water management.
4. Organic weed management: cultural, mechanical, biological, and mulching methods.

Unit-IV: Plant Protection in Organic Systems — 9 Hrs.

1. Insect pest management: biological control agents, biopesticides, trap crops.
2. Disease management: resistant varieties, sanitation, botanicals, microbial antagonists.
3. Weed suppression through ecological and non-chemical approaches.
4. Permitted and prohibited substances in organic plant protection (NPOP / IFOAM).

Unit–V: Organic Certification and Farm Management — 10 Hrs.

1. Organic standards: NPOP, IFOAM, USDA-NOP — principles and requirements.
2. Certification procedures: application, inspection, documentation, ICS.
3. Record keeping: field logs, input registers, traceability systems.
4. Labeling, packaging, marketing, and export regulations for organic produce.

IV. Text Books:

1. Palaniappan, S.P. & Annadurai, K. (2014). *Organic Farming: Principles and Practices*. Scientific Publishers, Jodhpur.
2. Lampkin, N. (2019). *Organic Farming*. Farming Press, UK.
3. Yadav, A.K. (2017). *Organic Agriculture: Concepts and Practices*. CBS Publishers, New Delhi.

V. Reference Books:

1. Tharmaraj, K. & Somasundaram, E. (2015). *Handbook of Organic Farming*. Agrobios (India).
2. FAO (2018). *Organic Agriculture and Sustainable Food Systems*. FAO Publications.
3. IFOAM Training Manuals on Organic Farming.
4. ICAR Publications on Organic Farming and Certification.

VI. Suggested Activities and Evaluation Methods:

Unit–I: Activity: Comparative chart on farming systems (organic vs conventional).

Evaluation: Rubric-based assessment.

Unit–II: Activity: Soil fertility plan using organic inputs.

Evaluation: Logic and feasibility.

Unit–III: Activity: Design of an organic cropping system.

Evaluation: Conceptual clarity.

Unit–IV: Activity: Case study on organic pest management.

Evaluation: Scientific reasoning.

Unit–V: Activity: Preparation of mock certification documents.

Evaluation: Accuracy and completeness.

COs / PLOs	PLO-1	PLO-2	PLO-3	PLO-4	PLO-5	PLO-6	PLO-7	PLO-8	PLO-9	PLO-10
CO-1	3	2	2	–	–	–	2	2	2	2
CO-2	3	3	2	2	–	–	2	2	2	–
CO-3	3	3	3	2	–	–	2	2	2	2
CO-4	3	2	2	3	2	–	2	2	3	3
CO-5	3	2	2	3	2	2	2	2	3	3

(3 = High, 2 = Moderate, 1 = Low, – = No direct correlation)

Government College (Autonomous), Rajamahendravaram
I B.Sc., (Hons.) Organic Farming - Semester- II
Core Course-4: PRINCIPLES OF ORGANIC FARMING

Practical

Credits: 1

2 Hrs./week

I. Course Outcomes: On successful completion of this practical course, student shall be able to:

1. Identify and prepare organic inputs and manures.
2. Demonstrate organic crop production and protection practices.
3. Maintain certification and documentation records.

II. Laboratory / Field Exercises:

1. Identification of organic manures, composts, green manures, and biofertilizers.
2. Preparation of FYM, compost, and vermicompost.
3. Field visit to organic farms for cropping and biomass recycling observations.
4. Demonstration of green manuring practices.
5. Preparation of botanical extracts and liquid organic formulations.
6. Identification of biological pest control agents.
7. Observation of organic weed management methods.
8. Soil sampling and soil health assessment under organic systems.
9. Demonstration of organic seed treatment methods.
10. Layout and management of an organic nursery.
11. Study of organic certification documents and inspection procedures.
12. Evaluation of labeling, packaging, and marketing standards for organic produce.