

Course Syllabus

Paper-I: Microbial Diversity and Early Land Plants

(w.e.f. Academic Year: 2025-2026)

Course Objectives: This course is designed to

COB 1: To increase the understanding about the microbial diversity and early land plants.

COB 2: To know the classification, structure and growth of early land plants.

COB 3: To aware about the adverse effects of pathogens, symptoms.

COB 4: To know the morphology, internal structure and reproduction in algae, fungi, bryophytes and pteridophytes.

UNIT - I: (15 hours)

1. Brief account of Archaeobacteria, Actinomycetes and Mycoplasma with reference to Little Leaf of Brinjal and Papaya Leaf Curl.
2. **Viruses:** Structure, replication and transmission; plant diseases caused by viruses and their control with reference to Tobacco Mosaic and Rice Tungro.
3. **Bacteria:** Structure, nutrition, and reproduction. Plant diseases caused by bacteria and their control with reference to Angular leaf spot of Cotton and Bacterial blight of Rice.

UNIT-II (15 hours)

4. General characters, structure, reproduction and classification of Algae (Fritsch).
5. **Cyanobacteria:** General characters, cell structure their significance as biofertilizers with special reference to *Oscillatoria*, *Nostoc* and *Anabaena*.
6. **Algae:** Structure and reproduction of the following:
Chlorophyceae – *Volvox*, and *Chara*

Phaeophyceae – *Ectocarpus*
Rhodophyceae - *Polysiphonia*

UNIT-III (15 hours)

7. General characters and classification of Fungi (Ainsworth).
8. **Fungi:** Structure, reproduction and life cycle by the following:
 - (a) Mastigimycotina- *Albugo*
 - (b) Zygomycotina – *Mucor*
 - (c) Ascomycotina – *Penicillium*
 - (d) Basidiomycotina – *Puccinia*
 - (e) Deuteromycotina – *Cercospora*

9. Economic importance of Lichens

UNIT-IV

(15 hours)

10. **Bryophytes:** Structure, reproduction, life cycle and systematic position of *Marchantia* and *Polytrichum*; Evolution of Sporophyte in Bryophytes.
11. **Pteridophytes:** Structure, reproduction, life cycle and systematic position of *Rhynia*, *Equisetum* and *Marsilea*.
12. Stellar evolution, Heterospory and Seed habit in Pteridophytes.

Course Outcome: By the end of the course, the student will be able to

CO 1: Develop the concept on microbial diversity and early land plants.

CO 2: Learn the classification, structure and growth of the organisms.

CO 3: Know the impact of pathogens, adverse effects and control measures.

CO 4: Aware about the morphology, internal structure and reproductive methods in algae, fungi, bryophytes and pteridophytes.

Paper-II: Gymnosperms, Anatomy and Embryology of Angiosperms

(w.e.f. Academic Year: 2025-2026)

Course Objectives: This course is designed to

COB 1: To understand the morphology and diversity of Gymnosperms.

COB 2: To understand about various tissues, tissue systems and growth in plants.

COB 3: To know about the scope and importance of plant anatomy

COB 4: To understand the structure, development of anther, ovule and pollination mechanisms.

UNIT - I

(15 hours)

1. Gymnosperms: Distribution, General characters, structure, reproduction and classification (Sporne, 1965). Economic importance of Gymnosperms.
2. Morphology of vegetative and reproductive parts, systematic position and life cycle of *Pinus* and *Gnetum*.
3. Introduction to Palaeobotany, Types of fossils and fossilization, Importance of fossils.

UNIT-II

(15 hours)

4. Meristems: Types, histological organization of shoot and root apices and theories.
5. Tissues and Tissue systems: Simple, complex and special tissues.

6. Leaf: internal structure of dicot and monocot leaf; Stomata structure and types. Epidermal outgrowths.

UNIT-III

(15 hours)

7. Secondary growth: Vascular cambium – structure and function. Secondary growth in root and stem, Wood (heart wood and sapwood).
8. Anomalous secondary growth of Stem - *Achyranthes*, *Boerhavia*, *Dracaena*; Root- *Beta*
9. Wood structure: General account. Study of local timbers – Teak (*Tectona grandis*), Red sanders (*Pterocarpus santalinus*), and Neem (*Azadirachta indica*)

UNIT – IV

(15 hours)

10. Structure of Anther, Microsporogenesis and development of male gametophyte.
11. Ovule structure and types; Megasporogenesis; types and development of female gametophyte.
12. Pollination mechanisms, Pollen – pistil interaction. Double Fertilization.
5. Types of Endosperm. Embryo structure – Dicot and Monocot; Polyembryony and Apomixis - an outline.

Course Outcome: By the end of the course, the student will be able to

CO 1: Develop the concept on morphology and diversity of Gymnosperms.

CO 2: Know the composition of body with different tissues, tissue systems and growth type.

CO 3: Come to know the scope and importance of plant anatomy.

CO 4: Understand the structure, development of anther, ovule and pollination mechanisms.