

UNIFIED SYLLABUS

BOTANY B.Sc.-Ist Year

PAPER-I—MICROBIAL DIVERSITY AND PLANT PATHOLOGY

- UNIT-I Microbial Techniques & instrumentation: Microscopy**—Light, phase contrast, scanning and transmission electron microscopy, staining techniques for light microscopy. Common equipment of microbiology lab and principle of their working—autoclave, oven, laminar air flow, centrifuge, colorimetry, spectrophotometry, electrophoresis, immobilization methods, fermentation and fermenters.
- UNIT-II Microbial world** : Cell structure of Eukaryotic and prokaryotic cells, Gram positive and Gram-negative bacteria, Structure of bacteria; Bacterial Growth curve, factors affecting growth of microbes; Sporulation, reproduction, recombination in bacteria. Viruses, general characteristics, Structure of viruses, Bacteriophages and TMV; Lytic and Lysogenic cycles, viroid, Prions & mycoplasma, phytoplasma, actinomycetes and their economic uses.
- Applied Microbiology**: Food fermentations and food produced by microbes, Production of antibiotics, enzymes, alcoholic beverages, Lactic acid and Acetic acid production. Antigen, antibody and production of monoclonal antibodies (Hybridoma techniques).
- UNIT-III Phycology**: General characteristic features, classification and range of thallus organization. Classification and life cycle of—*Volvox*, *Oedogonium*, *Chara*, *Vaucheria*, *Ectocarpus* and *Polysiphonia*. Economic importance of algae - Role of algae in soil fertility, algae as biofertilizer, blue green algae and nitrogen economy of soil; algae as biofuel.
- UNIT-IV Mycology, Mushroom Cultivation, Lichenology & Mycorrhiza**: General characteristic features, Economic importance and Classification of Fungi. Distinguishing characters of Myxomycota: General characters of Mastigomycota : *Phytophthora* and *Albugo*, Zygomycota : *Rhizopus* and *Mucor*, Ascomycota : *Saccharomyces*, *Penicillium*, *Peziza*. Basidiomycota : *Ustilago*, *Puccinia*, *Agaricus*; Deuteromycota : *Colletotrichum*, *Fusarium*, *Alternaria*. Heterothallism, Physiological specialization, Heterokaryosis & Parasexuality, Mushroom cultivation- Button and Oyster mushroom General account of lichens, reproduction and significance; Mycorrhiza: ectomycorrhiza and endomycorrhiza and their significance.
- UNIT-V Plant Pathology** : Disease concept, Symptoms, Etiology, Primary and secondary inoculum, pathogenesis, Koch's Postulates. Mechanism of infection and predisposing factors. Disease reoccurrence, Defence mechanism : physical and biochemical, Disease Resistance, Systemic fungicides, Organomercurials and sulphur containing fungicides

Diseases and Control : Symptoms, Causal organism, Disease cycle and Control measures of—Ear & Late Blight of Potato, Damping of seedlings, False Smut of Rice/ Brown spot of rice, Black Stem Rust of Wheat, Alternaria spot and White rust of Crucifers, Red Rot of Sugarcane, Wilting of Arhar, Mosaic diseases on tobacco and cucumber, yellow vein mosaic of bhindi; Citrus Canker, Little leaf, brinjal; Disease management: Quarantine organization and Integrated plant disease management Biological control

PAPER-II—ARCHEGONIATEAE AND PLANT ARCHITECTURE

- UNIT-I Introduction to Archegoniates & Bryophytes** : Unique features of archegoniates, Bryophytes: General characteristic features and Affinities, adaptations to land habit, Range of thallus organization. Classification (up to family), morphology, anatomy and reproduction of Riccia, Marchantia, Anthoceros and Sphagnum. (Developmental details not to be included). Economic importance of bryophytes.
- UNIT-II Pteridophytes** : General characteristic features and affinities, Classification (up to family) with examples. Heterospory and seed habit, stelar evolution, economic importance of Pteridophytes, Morphology, anatomy and life cycle of *Psilotum*, *Lycopodium*, *Selaginella*, *Equisetum*, *Pteris* and *Marselia*.
- UNIT-III Gymnosperms** : Classification and distribution of gymnosperms; Salient features of Cycadales, Ginkgoales, Coniferales and Gnetales, their examples, structure and reproduction; economic importance, Morphology, anatomy and life cycle of *Cycas*, *Pinus* and *Ephedra*.
- UNIT-IV Palaeobotany** : General account, Geological time scale; Brief account of process of fossilization, types of fossils and their study techniques; Fossil plants: *Rhynia*, *Williamsonia*, *Cycadeoideum*. Contribution of Prof. Birbal Sahni.
- UNIT-V Angiosperm Morphology (Stem, Roots, Leaves, Flowers and Inflorescence)** : Morphology and modifications of root; Stem, leaf and bud. Types of inflorescences; flowers, flower parts, fruits and types of placentation; Definition and types of seeds.