

Botany Department

Teaching plan

Session: 2025-26 (Odd Semester)

Name of Teacher- Dr. Himanshu

Class–B.Sc.3rd Year (5th sem)

Subject – Paper 1. Plant Physiology

Paper 2. Ecology

Weeks	Syllabus
Week1	Plant-water relations: Importance of water to plant life; Different physical and Chemical properties of water
Week2	Imbibition, diffusion and osmosis; absorption and transport of water; transpiration; physiology of stomata
Week3	Mineral nutrition: Essential macro and micro elements and their role; Mineral uptake; deficiency symptoms
Week4	Transport of organic substances: Mechanism of phloem transport; source-sink relationship; factors affecting translocation
Week5	Photosynthesis : significance; historical aspects; photosynthetic pigments, Action spectra and enhancement effects; concept of two photosystems
Week6	Z-scheme; photo- phosphorylation; Calvin cycle; C4 pathway; CAM plants; photorespiration
Week7	Growth and development : Definitions; phases of growth and development, Seed dormancy; plant movements; the concept of photoperiodism
Week8	Physiology of flowering; florigen concept; physiology of senescence; fruit ripening
Week9	Plant hormones- auxins, gibberellins, cytokinin, history of their discovery mechanism of action, Abscissic acid and ethylene, history of their discovery, mechanism of action
Week 10	Photo-morphogenesis Concept, Role of different photoreceptors in Photomorphogenesis, Phytochromes and their discovery, , physiological role and mechanism of action.
Week 11	Introduction to Ecology: Definition; scope and importance; levels of organization, Environment: Introduction; environmental factors- climatic (water, humidity, wind, light, temperature)
Week 12	Edaphic (soil profile, physicochemical properties), topographic and biotic factors (species interaction).
Week13	Adaptations of plants to water stress and salinity (morphological and anatomical features of hydrophytes, xerophytes and halophytes).
Week 14	Population ecology: Basic concept; characteristics; biotic potential, growth curves; ecotypes and ecads.
Week 15	Community ecology: Concepts; characteristics (qualitative and quantitative analytical and synthetic); methods of analysis; ecological succession.
Week 16	Ecosystem: Structure (components) and functions (trophic levels, food chains, food webs, ecological pyramids and energy flow), Biogeochemical cycles: Carbon, nitrogen, phosphorus and hydrological cycle
Week 17	Phyto-geography: Phyto- geographical regions of India; vegetation types of India (forests). Environmental pollution: Sources, types and control of air and water pollution. Global change: Greenhouse effect and greenhouse gases; impacts of global warming; carbon trading; Ozone layer depletion; Biomagnification
Week 18	Assignment and revision

Name of Teacher- Dr. Himanshu
Class–B.Sc.2nd Year (3rd sem)
Subject- Plant Taxonomy

Weeks	Syllabus
Week1	Taxonomy and Systematics, Fundamental components of taxonomy (identification, classification, description, nomenclature and phylogeny)
Week2	Role of chemotaxonomy, cytotaxonomy and taximetrics in relation to taxonomy, Botanical nomenclature, principles and rules, principle of priority,
Week3	Type concept, taxonomic ranks, Keys to identification of plant.
Week4	Type concept, taxonomic ranks, Salient features of the systems of classification of angiosperms proposed by Bentham & Hooker
Week5	Systems of classification of angiosperms proposed by Engler& Prantl, Floral Terms and Types of Inflorescences.
Week6	Diagnostic features and economic importance of the following families: Ranunculaceae, Brassicaceae
Week7	Diagnostic features and economic importance of the following families: Malvaceae, Euphorbiaceae,
Week8	Diagnostic features and economic importance of the following families: Rutaceae, Fabaceae
Week9	Diversity of Flowering Plants: Diagnostic features and economic importance of the following families: Cucurbitaceae, Rosaceae
Week 10	Diversity of Flowering Plants: Diagnostic features and economic importance of the following families: Apocyanaceae, Apiaceae.
Week 11	Diversity of Flowering Plants: Diagnostic features and economic importance of the following families: Asclepiadaceae, Solanaceae,
Week 12	Diversity of Flowering Plants: Diagnostic features and economic importance of the following families: Asteraceae, Liliaceae
Week 13	Diversity of Flowering Plants: Diagnostic features and economic importance of the following families: Poaceae
Week 14	Biodiversity hotspots: Global and Indian perspectives. Diversity of Flowering Plants.
Week 15	Different methods of plants identification: Herbarium, keys
Week 16	Different methods of plants identification- Literature Survey, internet
Week 17	BSI, NBPGR, NBRI. Indian contribution in plant taxonomy
Week 18	Revision and Assignment

Name of Teacher- Dr. Himanshu
Class- B.Sc. Life Science Ist Year
(1st Sem)
Subject- Diversity of Microbes

WEEKS	SYLLABUS
Week1	Viruses: Discovery, physiochemical and biological characteristics; classification (Baltimore)
Week2	General structure with special reference to viroids and prions; replication (general account), DNA virus (T-phage), lytic and lysogenic cycle; RNA virus (TMV).
Week3	Bacteria: Discovery, general characteristics; Types-archaebacteria, eubacteria, wall-less forms (mycoplasma and spheroplasts); Cell structure; Nutritional types;
Week4	Reproduction-vegetative, asexual and recombination (conjugation, transformation and transduction). Economic importance of bacteria with reference to their role in agriculture and industry (fermentation and medicine).
Week5	Cyanobacteria: General characters; thallus organization; cell structure; heterocyst and akinete development; reproduction; Life-cycle of <i>Nostoc</i> . Economic Importance of Cyanobacteria.
Week6	Algae: General characteristics; Algae in diversified habitats (terrestrial, freshwater, marine); thallus organization; cell ultrastructure; reproduction (vegetative, asexual and sexual); Algal classification criteria- pigments, reserve food and flagella; Classification upto classes (Smith, 1955); algal blooms and red tides; algal biofertilizers.
Week7	Morphology and life-cycle of <i>Volvox</i> , <i>Oedogonium</i> (Chlorophyceae)
Week8	Morphology and life-cycle of <i>Vaucheria</i> (Xanthophyceae)
Week9	Morphology and life cycle of <i>Ectocarpus</i> (Phaeophyceae) and <i>Polysiphonia</i> (Rhodophyceae) Economic importance of algae
Week10	Fungi: General characteristics; organization of thallus; nutrition and reproduction; Classification upto classes (Ainsworth, 1966); Morphology and life-cycles of <i>Phytophthora</i> (Mastigomycotina),
Week11	Morphology and life cycle of <i>Mucor</i> (Zygomycotina)
Week12	Morphology and life cycle of <i>Penicillium</i> (Ascomycotina)
Week13	Morphology and life cycle of <i>Puccinia</i> (Basidiomycotina)
Week14	Morphology and life cycle of <i>Agaricus</i> (Basidiomycotina)
Week15	Morphology and life cycle of <i>Collectotrichum</i> (Deuteromycotina); Economic importance of fungi
Week16	Lichens: Classification, morphology, internal structure, reproduction and Economic importance
Week 17	Mycorrhiza: Ectomycorrhiza and endomycorrhiza and their significance
Week 18	Assignment and Revision