

SYLLABUS IN BOTANY

Bacteria and Virus: Structure, reproduction and economic importance of bacteria; Virus- types, structure and reproduction of bacteriophage.

Algae: General Characters, classification and economic importance of algae. Structure and life cycle of *Volvox*, *Oedogonium*, *Vaucheria*, *Ectocarpus*, *Polysiphonia*.

Fungi: General account and economic importance of fungi. Life cycles of *Saprolegnia*, *Mucor*, *Puccinia*, *Agaricus*. Structure, reproduction and economic importance of Lichens.

Archegoniate: General characters and economic importance of Bryophyta, Pteridophyta and Gymnosperms. Morphology, anatomy and reproduction of *Riccia*, *Anthoceros*, *Funaria*, *Rhynia*, *Psilotum*, *Lycopodium*, *Selaginella*, *Equisetum*, *Pteris*, *Cycas*, *Pinus*, *Gnetum*. Heterospory and seed habit, stelar evolution.

Plant Anatomy: Tissues and tissue systems. Primary structure of stem, root and leaves. Normal secondary growth in stem and root.

Cell Biology: Prokaryotic and eukaryotic cells, plant cell wall, fluid mosaic model of cell membrane. structure and functions of cell organelles.

Cell division: Cell cycle, mitosis and meiosis, cytokinesis.

Genetics: Mendelism- Mono- and dihybrid cross, Gene interactions, chromosomal aberrations, euploidy and aneuploidy, linkage and crossing over.

Nucleic Acids: Double helical structure of DNA, A, B and Z forms of DNA, organisation of chromatin. Structure and functions of RNA.

Gene expression and regulation: Structure of prokaryotic and eukaryotic genes, Transcription, Processing of RNA, genetic code and translation. Gene regulation in prokaryotes- operon concept.

Recombinant DNA Technology: Enzymes of r-DNA technology, cloning vectors, transformation, gene cloning.

Plant Biotechnology: Totipotency, plant tissue culture, Transgenic crops.

Plant-physiology: Water relation in plants, diffusion and osmosis, water potential, absorption of water, transpiration-pull mechanism, transpiration: mechanism of stomatal movement, Photosynthesis- light reactions and Carbon reduction reactions, C₃ and C₄ plants, translocation of photosynthate. Respiration- Glycolysis, TCA cycle and oxidative phosphorylation, fermentation. Nitrogen metabolism: Biological nitrogen fixation, nitrate and ammonia assimilation.

Plant Growth and Development: Physiology of seed dormancy and seed germination, Phytohormones- auxins, gibberellins, cytokinin, abscisic acid and ethylene, Photoperiodism, vernalisation.

Plant Breeding: Selection of self-pollinated and cross-pollinated plants, hybridisation technique, heterosis.

Ecology: Ecosystem-Structure and functions of ecosystem, food chain, food web and ecological pyramids, aquatic (Fresh Water), terrestrial (forest/grassland), Man- made ecosystems. Renewable and non-renewable natural resources and their management, conservation. Environmental pollution: Air, water and soil pollution and their management, global warming.

Embryology of Angiosperms: Male and female gametophytes, double fertilisation, types of endosperms, Dicot and monocot embryo.

Economic Botany: Centre of origin of crop plants, economically important plants- origin, botany and economic importance of rice, sugar cane, tea, black pepper, tobacco, ground nut, rubber, jute.

Plant systematics: Systems of classification- Bentham and Hooker's system, Engler and Prantl's system, Herbaria and botanic gardens. Characteristics of families Ranunculaceae, Fabaceae, Asclepiadaceae, Euphorbiaceae, Asteraceae, Liliaceae, Poaceae and Orchidaceae.
