

Lesson Plan: 24 Feb. 2025- May 2025 Class B.Sc 1 year 2nd sem.

Name of Assistant Professor: **Dr Amit**

Subject:- Botany

Paper- **Plant Taxonomy and Ecology**

Week	Topics
Week 1	Botanical nomenclature and major rules of ICBN and ICN; Keys to identification of plants. General introduction and importance of herbaria and botanical gardens.
Week 2	Documentation of Floristic Diversity: Brief idea about floras, monographs and journals. Brief idea of taxonomic evidences, Types of inflorescence, flower and parts of flower.
Week 3	Artificial , natural and phylogenetic classifications. Bentham and Hooker system of classification (upto series), Angiosperm Phylogeny Group-general account.
Week 4	Diagnostic features and economic importance of the following families: Ranunculaceae, Brassicaceae, Malvaceae, Euphorbiaceae
Week 5	Rutaceae, Leguminosae, Apocynaceae, Lamiaceae,
Week 6	Solanaceae, Asteraceae, Poaceae and Orchidaceae
Week 7	Ecology : Definition; scope and importance; levels of organization. Environmental factors- climatic factors, edaphic factors, topographic; and Biotic factors. Population Ecology: Basic concept; characteristics; biotic potential, growth curves; ecotypes and ecads.
Week 8	Community Ecology: Concepts; characteristics (qualitative and quantitative-analytical and synthetic); methods of analysis; ecological succession.
Week 9	Ecosystem : Structure and functions (trophic levels, food chains, food webs, ecological pyramids and energy flow). Phyto-geography: Phyto-geographical regions of India; vegetation types of India (forests)
Week 10	Environmental Pollution: Sources, types and control of air and water pollution. Global Change: Greenhouse effect and greenhouse gases; impacts of global warming; carbon trading.
Week 11	Biodiversity : levels, types, significance, threats and conservation.
Week 12	Revision and Test

Lesson Plan: 24 Feb. 2025- May 2025

Class - B.Sc 2 year 4th sem.

Name of Assistant Professor: **Dr Amit**

Subject:- Botany

Paper- Cytology and Genetics

Week	Topics
Week 1	Cell as a unit of Life; The Cell Theory; Prokaryotic and eukaryotic cells; Eukaryotic Cell components, Structure and functions of Cell Wall, Plasma Membrane
Week 2	nucleus, Nuclear Envelope- structure of nuclear pore complex, Golgi Apparatus, Ribosome, Endoplasmic Reticulum, Chloroplast
Week 3	Mitochondria, Lysosomes, Peroxisomes and Vacuoles
Week 4	Cell Division: Mitosis and Meiosis
Week 5	Chromosome: structural organization, ultrastructure of Centromere and Telomere, lampbrush and polytene chromosomes.
Week 6	DNA: structure, types and replication. RNA: structure and types. Genetic code.
Week 7	Mendel's laws of Inheritance. Lethal Genes; Codominance, incomplete dominance;
Week 8	Gene interaction (inter- and intra-allelic); Multiple allelism; Pleiotropism. Chi Square test; Pedigree Analysis
Week 9	Cytoplasmic Inheritance: Kappa particles in Paramecium, leaf variegation in <i>Mirabilis jalapa</i> , Shell coiling
Week 10	Complete & incomplete linkage, recombination frequency, crossing over.
Week 11	Chromosomal aberrations- deletions, duplications, translocations, inversions; Variations in chromosome number-aneuploidy, polyploidy;
Week 12	sex chromosomes and sex determination. Types of mutations, effects of physical & chemical mutagens.
Week 13	Final Revision & Test

Lesson Plan: 22 Jan. 2025- April 2025

Class B.Sc 3rd year 6th sem.

Name of Assistant Professor: **Dr Amit**

Subject:- Botany

Paper- **Biochemistry and Plant Biotechnology & Economic Botany**

Week	Topics
Week 1	Basics of Enzymology: Discovery and nomenclature; characteristics of enzymes; concept of holoenzyme, apoenzyme, coenzyme and co-factors; regulation of enzyme activity; mechanism of action.
Week 2	Growth and development: Definitions; phases of growth and development; Plant hormones- auxins, gibberellins, cytokinins, abscissic acid and ethylene, history of their discovery, mechanism of action;
Week 3	photo-morphogenesis; phytochromes and their discovery, physiological role and mechanism of action, Lipid metabolism: Structure and functions of lipids; fatty acid biosynthesis; B-oxidation; saturated and unsaturated fatty acids; storage and mobilization of fatty acids
Week 4	Nitrogen metabolism: Biology of nitrogen fixation; importance of nitrate reductase and its regulation; ammonium assimilation
Week 5	Genetic engineering and Biotechnology: Tools and techniques of recombinant DNA technology; cloning vectors; genomic and cDNA library; transposable elements;
Week 6	aspects of plant tissue culture; cellular totipotency, differentiation and morphogenesis; biology of Agrobacterium; vectors for gene delivery and marker genes.
Week 7	Origin, distribution, botanical description, brief idea of cultivation and uses of the following: Food plants- Cereals (Rice, Wheat and Maize). Pulses- (Gram, Arhar and Pea)
Week 8	Origin, distribution, botanical description, brief idea of cultivation and uses of the following: Vegetables- (Potato, Tomato and Onion). Fibers- Cotton, Jute and Flax. Oils- Groundnut, Mustard and Coconut
Week 9	Morphology of plant part used, brief idea of cultivation and uses of the following: Spices- Coriander, Ferula, Ginger, Turmeric, Cloves. Medicinal Plants- <i>Cinchona</i> , <i>Rauwolfia</i> , <i>Atropa</i> , <i>Opium</i> , <i>Cannabis</i> , Neem.
Week 10	Botanical description and processing of: Beverages- Tea and Coffee. Rubber- <i>Hevea</i> . Sugar- Sugarcane
Week 11	General account and sources of timber; energy plantations and bio-fuels.
Week 12	Revision Test

