Syllabus for Botany: CSIR-CDRI, Lucknow

Diversity of Angiosperms: Systematics, Development & Reproduction

Principles of classification, nomenclature, comparative study of different classification systems, *viz*. Linnaeus, Bentham & Hooker, Engler & Prantl, Hutchinson and Cronquist, Herbarium techniques and important Botanic Gardens.

Taxonomic study of following families and their economic importance

Dicots: Nymphaeaceae, Nelumbonaceae. Ranunculaceae, Malvaceae, Bombacaceae, Brassicaceae, Cucurbitaceae, Rosaceae. Leguminosacae, Myrtaceae, Rutaceae, Apiaceae, Apocynaceae, Solanaceae, Convolvulaceae, Cuscutaceae, Scrophulariaceae, Acanthaceae, Lamiaceae, Asteraceae, Rubiaceae, Euphorbiaceae, and Amaranthaceae.

Monocots: Cyperaceae, Poaceae, Arecaceae, Liliaceae.

External morphology of vegetative and floral parts, modifications: phyllodes, cladodes, and phylloclades. Totipotency, Meristems-kinds of tissue system - epidermal, ground, and vascular. Anatomy of roots, stems, and leaves. Cambium: its function and anomalies in roots and stems. Economic botany: names, uses and chemical constituents of medicinal plants.

Structure and development of male and female gametophytes: microsporangium, microsporogenesis, microgametogenesis, megasporogenesis, megagametogenesis, types and modes of pollination, fertilization, double fertilization, polyspermy, development of embryo, embryo sac types, endosperm development and its morphological nature, polyembryony, apomixes, seed development, embryology in relation to taxonomy.

Cytology, Genetics, Evolution & Ecology

Cell structure, nucleus, cell organelles, structure and organization of chromosomes, nucleosome and solenoid model, special types of chromosomes: salivary gland, lampbrush and B chromosomes, Cell division: mitosis, meiosis; their significance, chromosomal aberrations

Mendel's laws of inheritance, interaction of genes, linkage, crossing over, cytoplasmic inheritance, sex determination.

Mutation: spontaneous and induced mutations, molecular mechanism and evolutionary significance of mutation, Changes in chromosome numbers: euploidy and anueploidy, their types and role in evolution. Evidences and theories of evolution.

Ecological adaptations, Plant types: Hydrophytes: *Hydrilla*, *Eichborina*, *Nymphaca*, *Typha*. Xerophytes: *Nerium*, *Casuarina*, *Saccharum*, *Begonia.* Population: structure and dynamics. Ecological succession: xeruseres, hydroseres. Ecosystem: structure & function. Biodiversity and conservation of natural plant resources.