

REVISED SYLLABUS – BOTANY
FIRST YEAR – THEORY
(Effective from 2003-2004)

- I. Introduction: 10 Periods
- i) Origin and development of Botany (in brief)
 - ii) Branches of Botany: Morphology, Cytology, Embryology, Palynology, Taxonomy, Physiology, Ecology, Palaeobotany, Genetics, Phytogeography, Phycology, Mycology, Lichenology, Bryology, Pteridology, Microbiology, Bacteriology, Virology.
 - iii) Botanical Institutes of India: BSI, NBRI, CIMAP, IARI, ICRISAT & FRI.
 - iv) Eminent Botanists of India: Prof. M.O.P.Iyengar, Dr.M.S.Swaminathan, Prof. Birbal Sahni, Prof K.C.Mehta, Prof.P.Maheshwari
- II. Morphology: 18 Periods
- A) Vegetative:
- i) Root: Types of roots, Modifications of roots: Epiphytic roots, Photosynthetic roots, Respiratory roots, Parasitic roots & Storage roots.
 - ii) Stem: Modifications of stem:
Aerial: Tendrils, Thorns, Hooks, Phylloclade, Tuberos & Bulbils
Sub Aerial: Runner, Stolon, Suckers & Offsets.
Underground: Rhizome, Corm, Stem tuber & Bulb
 - iii) Leaf: Parts of leaf (excluding types and modification of leaf bases, stipules and petiole).
Types of leaves, venation, phyllotaxy, leaf modifications: leaf tendrils, spines, scale leaves, phyllode, reproductive & trap leaves (Mechanism of trapping in *Nepenthes* only). Heterophylly.
- B. Reproductive:
- i) Inflorescence: Types of Inflorescence: Racemose, Cymose, Special types
 - ii) Flower: Structure of flower: Sexual distribution, symmetry of flower, position of gynoecium. Detailed description of flower: Perianth, aestivation, Androecium: Cohesion and Adhesion, Gynoecium including placentation (Excluding types and modifications of bracts, bracteoles and calyx)

- III. Reproduction in Angiosperms: 12 Periods
- i) Microsporogenesis and development of male gametophyte
 - ii) Ovule, megasporogenesis and development and structure of female gametophyte
 - iii) Pollination: Types of pollination, self and cross-pollination, contrivances for cross-pollination and self-pollination.
 - iv) Process of fertilization
 - v) Post fertilization changes
 - vi) Fruits: Types of fruits (false and true: Simple Fruits (Fleshy & Dry) Aggregate; Multiple fruits).

- IV. Plant Taxonomy: 12 Periods
- Introduction: Principles of plant classification (Identification, Nomenclature and classification), Brief account of Bentham & Hooker's system.
- Families:
- a) Malvaceae b) Fabaceae c) Asteraceae
 - d) Solanaceae and e) Liliaceae

- V. Economic Botany: 04 Periods
- Botanical name, family, morphology of useful parts and economic importance of the following:
 Cereals – Paddy; Millets – Jowar; Pulses – Redgram; Oilseeds – Groundnut; Fibres – Cotton; Fruit yielding – Mango; Medicinal Plants – Neem.

- VI. Cell Biology: 12 Periods
- Ultra structure of plant cell (Eukaryotic cell): Structure of cell wall and cell membrane
 Structure and functions of cell organelles (plastids, mitochondria, endoplasmic reticulum, ribosomes, golgi complex, lysosomes, vacuoles, peroxisomes and glyoxysomes) (Ergastic substances excluded)
 Nucleus, structure of chromosomes, nucleic acids
 Cell division: Mitosis and Meiosis.

VII. Internal Organization of Plants: 14 Periods

Meristematic and Permanent tissues – Types and functions of tissues.
Primary structure of root, stem and leaf of monocot and dicot plants.
Secondary growth in dicot stem.

VIII. Plant Ecology: 08 Periods

Plant communities: Hydrophytes, Xerophytes and Mesophytes.
Ecological adaptations (Morphological & Anatomical) of Hydrophytes and Xerophytes.

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