

COURSE: ANATOMY, EMBRYOLOGY AND ELEMENTARY MORPHOGENESIS

Course Code: BOT(N)202

Objectives- To study the cell structure, tissues (meristems, permanent tissue), normal and abnormal activity of cambium and development of male, female gamete including development of embryo and development of organs.

Syllabus-

- Tools and techniques in Plant anatomy.
- Types of Tissues and anatomy of root, shoot and leaf: Types of tissues (Meristematic, permanent and specialised tissue), A brief account of root, shoot and leaf anatomy.
- Structure of Vascular tissues: Structure of xylem and phloem, origin, structure and function of vascular cambium and its normal activity, Cork cambium, its activity and products.
- Normal and anomalous growth of root and stem: With special reference to the taxa: *Bougainvillea*, *Nyctanthes*, *Dracaena*, *Ficus*, *Tinospora* and Orchids.
- Male gametophytes: Structure of anther, microsporogenesis and development of male gametophytes in angiosperms.
- Female gametophytes: Structure of ovule, megasporogenesis and development of the female gametophytes with particular reference to polygonum type, comparison with Biosporic and Tetrasporic types.
- Fertilization and Post fertilization: Apomixes, Adventives embryony, Polyembryony and Parthenocarpy.
- Plant Morphogenesis and Morphogenetic factors: Basic idea of Morphogenesis and Concept of Differentiation, Polarity, Totipotency.
- Physiology of flowering: Basic concept of flowering, Photoperiodism and Vernalization.

Unit Schedule

BLOCK-1 GENERAL ANATOMY

- Unit-01 Tools and Techniques in Plant Anatomy
- Unit-02 Types of Tissues and Anatomy of Root, Shoot and Leaf
- Unit-03 Structure of Vascular tissues
- Unit-04 Normal and Anomalous growth of root and stem

BLOCK-2- EMBRYOLOGY

- Unit-05 Male Gametophytes
- Unit-06 Female Gametophytes
- Unit-07 Fertilization and Post Fertilization

BLOCK-3 ELEMENTARY MORPHOGENESIS

Unit-08 Plant Morphogenesis and Morphogenetic factors

Unit-09 Physiology of Flowering

COURSE: ANATOMY, EMBRYOLOGY AND ELEMENTARY MORPHOGENESIS (LABORATORY)

Course Code: BOT(N)202L

Objective- To identify the anatomical, embryological materials on preparation based description of the plant material.

Syllabus:

- **Anatomy and Embryology:** Study of various types of pollen grains, placentations, ovules development using temporary and permanent preparations Demonstration of usual techniques of Plant anatomy, section cutting, T.S., L.S. of leaf, stem and root. T.S. of anther, Normal and abnormal secondary growth in *Bougainvillea*, *Nyctanthes*, *Dracaena*, *Tinospora* and Orchids, senescence and pollen germination (hanging drop method), Structure and organization of the shoot apex (*Hydrilla verticellata*, *Ranunculus sceleratus* and *Euphorbia hirta*).

Exercise Schedule

- Exercise-01 : To study the various types of pollen grains, placentations, ovules development using temporary and permanent preparations.
- Exercise-02 : Demonstration of usual techniques of plant anatomy, section cutting, T.S., L.S. of leaf, stem and root.
- Exercise-03 : To study the normal and abnormal secondary growth.
- Exercise-04 : To study the structure and anatomy of some important stem.
- Exercise-05 : To study the internal structure of anther through T.S.