

MANGALORE UNIVERSITY
Department of Applied Botany

BOS409 - Anatomy & Histochemistry

Course outcome:

- Syllabus gives the basics of anatomy of vascular plants
- The working of various instruments useful for anatomical studies is given
- This trains students particularly in camera lucida and sectioning through microtomes
- All the useful staining techniques are also included
- These methods will be useful if students take up higher studies (Research) or they can set up a biological supplies company providing biological materials to institutions

Teaching Hours: 10/Unit

Unit I:

Primary vegetative body of the plant: Stem: Arrangement of tissues, epidermis, cortical bundles, medullary bundles, steles of various types: Leaf-Structure of foliage leaves, petiole and node of dicot leaves, vascular system of monocot leaves, stem-leaf junction of monocots, structure of fern and gymnosperm leaves: Structure of modified leaves-Kranz anatomy and C4 photosynthesis. Xerophytic and submerged foliage leaves, cataphylls, hypsophylls: Root-Structure of primary root, mucigel, epidermis, exodermis, dimorphic roots, root nodules.

Unit II:

Ultra structure of the cell wall and differentiation. Ultra structure and differentiation of xylem and phloem: tracheary elements and their differentiation, sieve elements and their differentiation. Meristems: Apical meristems, shoot apex of Pteridophytes, gymnosperms and angiosperms, root apex and intercalary meristems. Secondary growth of the plant body: Periderm, variations in wood structure. Anomalous secondary growth in climbers and monocots. Floral anatomy: Flower, flower parts and their arrangement, vascular system, floral meristem, origin and development of floral parts. Pathological Anatomy.

Unit III:

Plant Histochemistry:

Minerals, Carbohydrates, Lignins, Polyphenols, Proteins, Nucleic acids and Histones, Lipids, Cutin, Suberin and Waxes, Ascorbic acid. Study of the instruments, their principles and uses (a) Camera lucida, (b) Micrometry (c) Microtomes –sledge Rocking, Rotary (D) Fluorescence microscope (e) Electron Microscope.

Unit IV:

Staining technique –Principles of histochemical stains

s, Killing, fixing & staining of plant tissues; Important reagents & chemicals needed in the fixatives; FAA, Carnoy's fluid, Navashins solution, fleminge; Dehydrating agents, mounting media, Double staining, Saffranin, Fast green, Embedding: TBA method, embedding for electron microscope, Sectioning, Whole mounts maceration. Histochemical-PAS Test, Sudan black lipids, Feulgen reaction –N acids.