

**DEPARTMENT OF AGRICULTURAL BOTANY**  
**B.Sc. Ag. (Hons.)**

Sl. No.	Course	Cr. Hr.
<b>Level-1, Semester-I</b>		
1.	ABOT 103. Fundamentals of Agricultural Botany	02
2.	ABOT 104. Plant Morphology and Anatomy-Practical	02

**Level 1, Semester I**  
**ABOT 103. Fundamentals of Agricultural Botany**  
**Credit Hour 2**

**Plant Systematics:** Concept of taxa and botanical nomenclature, classical and modern systems of plant classification with special reference to molecular level, modern taxonomic ideas and terms.

**Economic Botany:** Introduction to the highly utilized and under-utilized economically important crops of Bangladesh such as cereals, fibre, timber, rubber, oil, beverages, narcotic, medicinal, perfume and dye yielding plants.

**Morphology:** External morphology of important crop plants with special reference to modification of different plant organs.

**Cell:** Ultrastructures and functions of different cell organelles; composition, structures, and patterns of thickening of cell wall.

**Tissue:** Classification, characteristics and function of different plant tissues; concept of the epidermal, vascular and fundamental tissue systems.

**Primary Plant Body:** Primary structures of different plant organs.

**Secondary Growth:** Activities of vascular cambium and phellogen; process of wound healing and abscission.

**Embryology:** Reproductive organs; formation of male and female spores and gametes; process of pollination and fertilization; development of embryo and endosperm.

**ABOT 104. Plant Morphology and Anatomy Practical**  
**Credit Hour 2**

Study of the important families of crop plants.

Study of the external morphology of important crop plants.

Study of common laboratory techniques related to plant anatomy-microscope handling, hand sectioning of plant parts, staining and mounting to prepare temporary slides.

Study of the anatomy of root, stem and leaf of important crop plants.

Visit to botanical gardens and national herbarium.

**References:**

1. A. C. Dutta. 1979. Botany for Degree Students. Oxford University Press.
2. Katherine Esau. 2006. Plant Anatomy. John Wiley and Sons Inc., New York.
3. A. J. Eames and L. H. Mac Daniels. 1953. An Introduction to Plant Anatomy. McGraw-Hill Book Co., New Delhi.

## Lecture Topics (Cell, Tissue & Tissue System)

### Cell

Ultrastructures and functions of different cell organelles; composition, structures.

**Cell wall:** Middle lamella, primary wall, secondary wall, plasmodesmata, patterns of thickening of cell wall. **protoplasm; cell membrane; nucleus:** nuclear envelope, nucleoplasm, chromatin fibre, nucleolus, **cytoplasm,** cytosol (cytoplasmic ground substance, hyaloplasm), ultrastructural organelles;

**Organelles bounded by two membranes:** Plastids and Mitochondria, types of plastids; **organelles bounded by one membrane:** peroxisomes, vacuoles, bounded by tonoplast, ribosomes, **endomembrane system (major components):** endoplasmic reticulum, golgi apparatus, vesicles; **cytoskeleton:** microtubules, actin filaments

### Tissue

Tissue, classification of tissue, meristematic tissue, and permanent tissue, characteristic features of meristematic tissue, classification of meristematic tissue: based on origin and development, based on the position in the plant body, based on their function, based on the planes of division, characteristic features of meristematic tissue, types of permanent tissue: simple tissue, features of parenchyma, collenchyma and sclerenchyma and difference among them.

Complex tissue, its types, xylem and phloem, components of xylem: a. Tracheids, b. Vessels, c. Xylem or wood parenchyma, d. Xylem or wood fibres, Protoxylem and Metaxylem: Exarch, mesarch, centrarch and endarch, components of phloem: sieve tubes, companion cells, phloem parenchyma and fibres, Protoxylem and Metaphloem, special tissue or secretory tissue.

Tissue system in plants; epidermal or dermal tissue system: dicot root, monocot root, dicot stem, monocot stem, dicot leaf, monocot leaf comparison. Description, functions, figures and examples. Cortical or fundamental or ground tissue system: Dicot root, monocot root, Dicot stem, monocot stem, dicot leaf, monocot leaf comparison. Description, functions, figures and examples. Vascular Tissue System: Types of vascular bundles: (Radial Vascular Bundles, Conjoint Vascular Bundles, Concentric Vascular Bundles). Description, figures and examples, comparison among the vascular bundle of dicot root, monocot root, dicot stem, monocot stem, dicot leaf, monocot leaf.