



Code	Subject Title	Cr. Hrs	Semester
BOT-311	Plant Anatomy (Advance Course)	3	VI
Year	Discipline		
3	Botany		

Syllabus Outline: An introduction of primary internal structures of tissue of root, stem, leaf flower and secondary growth of stem and analysis related to it.

Course Outline:

Secondary Xylem: Axial and Ray System, Growth Layers, Reaction Wood, Gymnosperm Wood, Angiosperm Wood, Differentiation in Secondary Xylem, Strength of Wood in Relation to Structure.

Stem: Tissue Systems, Leaf Traces, Leaf Gaps, Branch Traces and Branch Gaps, Vascular Bundles, Concept of Stele Delimitation of Vascular Region, Endodermis, Pericycle, Origin of Vascular Cambium, Common Forms of Secondary Growth.

Anomalous Secondary Growth: Secondary Growth in Monocots, Grafting and Wound Healing.

Types of Stems: Conifer. Woody Dicotyledons, Dicotyledonous Vine, Herbaceous Dicotyledons, Herbaceous Monocotyledons.

Leaf: Histology of Angiosperm, Leaf, Mesophyll, Vascular System, Bundle Sheaths, Supporting Structure, Secretary Structures, Petiole, Histology of Gymnosperm Leaf, Development of Leaf, Growth of Leaf Lamina, Monocotyledonous Leaf, Development of Vascular Tissues, Abscission of Leaves.

Root: Concept, Origin, Morphology, Primary Structure, Root Cap, Vascular Cylinder, Development of Histogens, Primary and Secondary Growth, Development of Lateral Roots, Development of Adventitious Roots, Development of Buds on Roots, Structure in Relation to Function.

Root-Shoot Transition: Secretary Structures, Glands, Nectaries, Hydathodes, Internal Secretary Structures, Laticifers.

Flower: Concept, Structure, Vascular System, Different Parts, Sepals, Petals, Stamen, Carpel, Ovule, Organogenesis, Histogenesis, Abscission.

Module Aims: To introduce Basic Concept of Primary Plant Body a learning Idea of Root-Shoot Transition, Secondary Growth and Anomalies, Types of Stem, Root and Leaf.

Learning Strategies:

1. Lectures
2. Group Discussion
3. Laboratory Work
4. Seminar/ Workshop

Learning Outcome: Student will understand basic anatomical concepts of Primary Structure of Root, Stem, Leaf and Flower. They will be able to discuss the idea of secondary growth.

Assessment Strategies:

1. Lecture Based Examination (Objective and Subjective)
2. Assignments
3. Class Discussion
4. Quiz
5. Tests



BOOKS RECOMMENDED:

1. **Evert, R.F. and Easu, K. (2006).** *Esau's Plant Anatomy*. John Wiley and Sons, Inc.
 2. **Fahn, A. (2001).** *Plant Anatomy (5th Ed.)*. Ergamon Press. Oxford.
 3. **Dickinson, W.C. (2000).** *Integrative Plant Anatomy*. Academic Press. London.
 4. **Esau, K. (2000).** *Anatomy of Seed Plants*. John Wiley and Sons Inc. New York.
 5. **Robson, N.K.B., Cutler, D.F. and Gregory, M. (2000).** *New Research in Plant Anatomy*. Academic Press, London.
 6. **Eames, E. (1990).** *An Introduction to Plant Anatomy*. McGraw Hill Book Co. Inc. New York.
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