

COURSE TITLE: BOTANY-II (PLANT SYSTEMATIC ANATOMY & DEVELOPMENT THEORY)

CREDIT HOURS: 3

Syllabus Outline:

Introduction to Plant Systematics, aims and objectives. History of classification, Introduction to nomenclature, International code Morphological study of families, Anatomical study of cell wall and the internal structure (tissues) of the plant body Simple and complex tissues structure, function and relationship. Developmental embryology.

Plant Systematics:

Introduction to Plant Systematics: aims, objectives and importance.

Classification:

Brief history of various systems of classification (Artificial, Natural and Phylogenetic) with emphasis on Takhtajan's System of Classification.

Nomenclature:

Introduction: Importance of Latin names and binomial nomenclature with an introduction to International code of Botanical Nomenclature ICBN), St. Luis Code.

Morphology:

Brief account of various morphological characters of root, stem and leaf. inflorescence, flower, placentaion and fruit types

Diagnostic Characters:

Economic importance and distribution patterns of the following families:

1. Ranunculaceae
2. Brassicaceae (Cruciferae)
3. Fabaceae (Leguminosae)
4. Rosaceae
5. Euphorbiaceae
6. Solanaceae
7. Lamiaceae (Labiatae)
8. Apiaceae (Umbelliferae)
9. Asteraceae (Composite)
10. Liliaceae (Sen.Lato)
11. Poaceae (Graminae)

Anatomy:

Cell wall structure and chemical composition

Simple Tissues:

Parenchyma, Collenchyma, Sclerenchyma

Epidermis:

Epidermis and epidermal appendages including stomata.

Complex tissues:

Xylem, Phloem

Meristem:

Types of meristem, stem and root apices, secondary meristem, vascular cambium and periderm. Structure and development of primary root and stem, structure of leaf. Developmental embryology: *Capsella bursa-pastoris*, structure of anther, microsporogenesis, Microgametophyte, structure of ovule, megasporogenesis, Megagametophyte, Endosperm formation

Evaluation Criteria

Examination	Type	Marks
Internal Examination	Sessional Work	15%
	Mid-Semester	25%
External Examination	Final Semester	60%

Books Recommended

1. Raven, P.H., Evert, R.E. and Eichhorn, S.E. (2010). *Biology of Plants*. W.H. Freeman and Company Worth Publisher.
2. Stuessy, T.F. (2009). *Plant Taxonomy*. Columbia University Press. USA.
3. Lawrence, G.H.M. (2007). *Taxonomy of Vascular Plants*. (2nd Ed.). MacMillan and Co. New York.
4. Raymond, F. and Eichhorn, S.E. (2005). *Esau's Plant Anatomy. Meristems cells and tissue of the plant body*, (3rd Ed.) John Wiley and Sons & Sons Inc.
5. Panday, B.P. (2004). *A Text Book of Botany (Angiosperms)*. S. Chand and Co. New Delhi.
6. Moore, R.C., W.D. Clark and Vodopich, D.S. (2003). *Botany*. McGraw Hill Company, U.S.A.
7. Mauseth, J. D. (1998). *An introduction to Plant Biology*. Multimedia Enhanced. Jones and Bartlett Publisher UK.
8. Fahn, A. (1990). *Plant Anatomy*. Pergamon Press Oxford.
9. Maheshwari, P. (1971). *Embryology of Angiosperms*. McGraw Hill. New York.
10. Esau, K. (1960). *Anatomy of Seed Plants* John Wiley and Sons, New York.

COURSE TITLE: BOTANY LAB-II (PLANT SYSTEMATIC ANATOMY & DEVELOPMENT THEORY)

CREDIT HOURS: 1

Syllabus Outline:

Identification of families, Technical description of the flowers, Field trips, Specimen collection, Epidermis. Epidermal appendages, study of stomata, Study of xylem, transverse section of leaf and stem.

Identification of families:

With the help of keys description of flower (in technical- terms) of the families Ranunculaceae, Brassicaceae, Fabaceae Rosaceae, Euphorbiaceae, Cucurbitaceae, Solanaceae, Lamiaceae, Apiaceae, Asteraceae, Liliaceae and Poaceae.

Field Trips:

Field trips shall be undertaken to study and collect local plants Students are required to submit forty fully identified herbarium specimens.

Anatomy:

Study of epidermis, stomata and trichomes

Tissues:

(Study of simple tissues from fresh material and prepared slides as well. Study of complex tissues: xylem, maceration and study of xylem from macerated material).

Stem and Leaf:

Make a transverse section of stem and leaf of angiosperm.

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1. Raven, PH. Even, R.E. and Eichhom, S.E. (2010). *Biology of Plants*. W.H. Freeman and Company Worth Publisher.
2. Lawrence, G.H.M. (2007). *Taxonomy of Vascular Plants*. (2nd Ed.). MacMillan and Co. New York.
3. Raymond, F. and Eicbhorn, S.E. (2005). *Esau's Plaiyt Anatomy. Meristerms cells and tissue of the plant body*, (3rd Ed.) John Wiley and Sons Inc. New York.
4. Panday, B.P. (2004). *A Text Book of Botany (Angiosperms)*. S. Chand and Co. New Delhi.

5. Moore, R.C., W.D. Clark and Vodopich, D.S. (2003).*Botany*. McGraw Hill Company, U.S.A.
6. Foster. F. (2002).*Practical Plant Anatomy*. John Wiley and Sons, New York.
7. Mauseth, J. D. (1998).*An introduction to Plant Biology*. Multimedia Enhanced. Jones and Bartlett Publisher. UK.
8. Zahur, M.S. (1992).*The Taxonomy of Angiosperms*. Al-Hejaz Printers. Lahore.
9. Fahn, A. (1990).*Plant Anatomy*. Pergamum Press Oxford.
10. Maheshwari, P. (1971).*Embryology of Angiosperms*. McGraw I-fill New York.
11. Esau, K. (1960).*Anatomy of Seed Plants*. John Wiley and Sons, New York.