Code	Subject Title	Cr. Hrs	Semester
BOT-104	Botany Lab-II (Plant Systematic Anatomy & Development Theory)	1	II

Year	Discipline
1	Botany, Zoology, Chemistry-I

Syllabus Outline: Identification of Families, Technical Description of Flower, Field Tours, Specimen Collection, Epidermis, Epidermal Appendages, Study of Stomata, Study of Xylem, Transverse Section of Leaf and Stem.

Course Outline:

Identification of Families with the help of keys,
Description of Flowers (in technical terms) of following Families;
Ranunculaceae, Brassicaceae, Fabaceae, Rosaceae, Euphorbiaceae, Cucurbitaceae, Solanaceae, Lamiaceae, Apiaceae, Asteraceae, Liliaceae and Poaceae.
Study Tours: Field tours shall be undertaken to study and collect local plants. Students are required to submit Forty (40) 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.

Module Aims: This course is designed to provide an insight of basic concepts of Plant Systematics, its Role in Classification, Anatomy in relation to Basic Structure of Plants and their Developmental Biology.

Learning Strategies:

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

Learning Outcome: Students are expected to learn about classification on the basis of anatomical difference into different groups.

Assessment Strategies:

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

Books Recommended:

1. **Raven, P.H., 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 Plant Anatomy. Meristematic 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., Clark, W.D. 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. **Maheshawari, P. (1971).** *Embryology of Angiosperms.* McGraw Hill. New York.

11. **Esau, K. (1960).** *Anatomy of Seed Plants.* John Wiley and Sons, New York.