



Institute of Botany
Faculty of Life Sciences
University of the Punjab, Lahore
Course Outline
Semester – VI



Programme	BS Botany	Course Code	Bot-313	Credit Hours	3(2+1)
Course Title	Systematics of Angiosperms (Theory)				
Introduction					
<p>This course is designed to explore the principles and practices of systematics of angiosperms and their classification. This course delves into the importance and interrelationship of plant systematics with other disciplines of science. Students will gain an understanding of the development of plant systematics, the mechanisms of speciation, and the types of variation within plant species. The course also covers the methodology and significance of biosystematics, various types of taxonomic evidences, and the principles of Botanical nomenclature. Additionally, students will learn about the history and importance of plant classification, including a brief overview of numerical taxonomy.</p>					
Learning Outcomes					
<p>On the completion of the course, the students will be able to:</p> <ul style="list-style-type: none"> • Understand the importance and interrelationship of plant systematics with other scientific disciplines. • Describe the concept of species and explain the mechanisms of speciation in plants. • Conduct and Biosystematics Studies and categorize plants into ecophene, ecotype, ecospecies, coenospecies, and comparium. • Apply the principles and rules of botanical nomenclature in the classification of plants. • Compare and contrast different systems of plant classification and understand their historical development and importance. • Accurately describe and identify plants of the local flora up to the species level using the Flora of Pakistan and other regional floras. • Develop and utilize indented and bracketed keys for plant identification. • Understand Angiosperm Families: Describe and classify plants from significant angiosperm families, recognizing their key characteristics and taxonomic relationships. 					
Course Contents					
<ul style="list-style-type: none"> • Introduction: Importance and relationship of Plant systematics with other sciences, Phases of plant taxonomy. • Concept of Species, Speciation: Mechanism of speciation. • Variation: Types of variation, Continuous and discontinuous variation, Clinal variation. • Biosystematics: Introduction and importance, Methodology of conducting biosystematics studies, various biosystematics categories such as ecophene, ecotype, ecospecies, coenospecies and comparium. • Taxonomic Evidence: Importance and types of taxonomic evidences: anatomical, cytological, chemical, molecular, palynological, geographical and embryological. • Nomenclature: Principles and important rules of botanical nomenclature. • Classification: Why classification is necessary? Importance of predictive value. Brief history, Different systems of classification with at least one example of each (Linnaeus, Bentham and Hooker, Engler and Prantl, Bessey, Cronquist, Takhtajan and Dahlgren. • Brief introduction of Numerical taxonomy. 					

Programme	BS Botany	Course Code	Bot-314	Credit Hours	1
Course Title	Systematics of Angiosperms (Lab)				
Lab Course Contents					
<ul style="list-style-type: none"> • Technical description of plants of the local flora and their identification up to species level with the help of a regional/Flora of Pakistan. 					

- Preparation of indented and bracketed types of keys.
- Submission of properly mounted and fully identified hundred herbarium specimens at the time of examination.
- Field trips shall be undertaken to study and collect plants from different ecological zones of Pakistan.
- Description of important families of angiosperms: Apiaceae (Umbelliferae), Arecaceae (Palmae), Asclepiadaceae, Asteraceae (Compositae), Boraginaceae, Brassicaceae (Cruciferae), Cannaceae, Capparidaceae, Caryophyllaceae, Casuarinaceae, Chenopodiaceae, Convolvulaceae, Cucurbitaceae, Cyperaceae, Euphorbiaceae, Fabaceae (Leguminosae), Juncaceae, Lamiaceae (Labiatae), Liliaceae, Magnoliaceae, Malvaceae, Myrtaceae, Orchidaceae, Papaveraceae, Poaceae (Graminae), Ranunculaceae, Rosaceae, Salicaceae, Scrophulariaceae, Solanaceae, Trochodendraceae, Winteraceae.

Textbooks and Reading Material

1. Ali, S. I. and Nasir, Y. (1995-to date). *Flora of Pakistan*. Karachi Univ. Press, Karachi.
2. Davis, P.H. and Heywood, V. H. (1963). *Principles of Angiosperm Taxonomy*. Oliver & Boyd, London.
3. Greuter, W., McNeill, J. Barrie, F.R., Burdet, H. M., Demoulin, V., Filguerras, T.S., Nicolson, D.H., Silva, P.C., Skog, J.E., Trehane, P., Turland, N. J. and Hawksworth, D. L. (2000). *International code of botanical nomenclature (Saint Louis Code) adopted by the Sixteenth International botanical congress St. Louis Missouri, July –August 1999*. Koeltz, Konigstein. (Regnum Veg.138.)
4. Judd, W.S., Campbell, C.S., Kellogg, E.A., Stevens, P.F. and Donoghue, M. J. (2015). *Plant Systematics; A phylogenetic Approach*, Sinauer, USA.
5. Levine, D. A. (2000). *The Origin, Expansion and Demise of Plant Species*. Oxford University Press.
6. Naik, V. N. (1988). *Taxonomy of Angiosperms*. Tata McGraw Hill Publishing Company, New Delhi.
7. Simpson, M. G. (2018). *Plant Systematics* (3rd edition). Elsevier Academic Press, UK. (Latest edition)
8. Singh, G. (2016). *Plant Systematics; An Integrated Approach* (3rd edition), University of Dehli, India.(Latest edition)
9. Stace, C. (1992). *Plant Taxonomy and Biosystematics*, Edward Arnold.
10. Takhtajan, A. (1986). *Flowering Plant: Origin and Dispersal*, Oliver and Boyd, Edinburgh.
11. D.J. Briggs and S.M. Walters. (2016) *Plant Variation and Evolution*, Cambridge University Press & Assessment
12. Journal Articles/ Reports Pakistan journal of Botany, Mycotaxon, Plant systematics and Evolution.

Teaching Learning Strategies

- Lectures
 - Group Discussion
 - Laboratory work
- Seminar/ Workshop

Assignments: Types and Number with Calendar

- Lecture Based Examination (Objective and Subjective)
 - Assignments
 - Quiz
- Class discussion
Tests
