Institute of Botany

Faculty of Life Sciences

University of the Punjab, Lahore

Course Outline

Semester – I

Programme	BS Botany	Course Code	Bot-112	Credit Hours	2
Course Title	**Diversity of Plants (Theory)**				

Introduction

"Diversity of Plants" course provides an extensive overview of the vast diversity within the plant kingdom, covering morphology, habitat, reproduction, and economic significance. This course explores various groups, including algae, fungi, bryophytes, pteridophytes, gymnosperms, and angiosperms, emphasizing their unique characteristics and roles in ecosystems. The collection, preparation, characterization, and identification of various plant groups is well elaborated in this course. A comprehensive understanding of plant diversity, through lectures, laboratory experiments, and field studies included in this course.

Learning Outcomes

On the completion of the course, the students will be able to:

- Accurately identify major plant groups and their distinctive features
- Describe the morphological and anatomical characteristics of various plant groups
- Explain the reproductive mechanisms and life cycles of different plants
- Analyze the economic importance and industrial applications of various plants, particularly fungi and algae
- Conduct fieldwork for learning plant species in detail

Course Contents

- General account of learning plant diversity including morphology, habitat, reproduction and economic signification
- Algae its diversity and importance: *Chlamydomonas, Spirogyra, Chara, Pinnularia, Ectocarpus* and *Polysiphonia*
- Fungi its diversity and importance: *Mucor, Penicillium, Phyllactinia, Ustilago, Puccinia* and *Agaricus,* their effects on crop production and industrial applications.
- Bryophytes its diversity and importance: *Riccia, Anthoceros, Funaria*
- Pteridophytes its diversity and importance: Fossils and Fossilization, Major Groups and their Affinities, Psilopsida (*Psilotum*), Lycopsida (*Selaginella*), Sphenopsida (*Equisetum*), Pteropsida (*Marsilea*).
- Gymnosperms its diversity and importance: *Cycas, Pinus* and *Ephedra*
- Angiosperms its diversity and importance: Dicots and Monocots
- Seed Habit: origin of seed habit, complexity of seed habit, adaptation of heterospory, retention and germination of single megaspore within a megasporangium.

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., Niclson, 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. Briggs, D.J. and Walters, S.M.. (2016) *Plant Variation and Evolution*, Cambridge University Press & Assessment
12. Journal Articles/ Reports: Pakistan journal of Botany, Mycotaxon, Plant systematics and Evolution, etc.

Teaching Learning Strategies

- Student Centered approach
- Lecture based Examination
- Assignments
- Class discussions
- Quiz

Assignments: Types and Number with Calendar

- Oral Presentations Total marks:25
- Final group-work project

Programme	**BS Botany**	**Course Code**	**Bot-113**	**Credit Hours**	1
Course Title	**Diversity of Plants (Lab)**				

Lab Course Contents

- Collection, slide preparation, identification, and characterization of Algal specimens from different sources
- Collection, slide preparation, identification, and characterization of Fungal specimens from different sources
- Collection, identification, and characterization of Bryophytes collected from different localities
- Collection, identification, and characterization of Pteridophytes collected from different localities
- Collection, identification, and characterization of Gymnosperms collected from different localities
- Collection, identification, and characterization of Angiosperms collected from different localities
- Study of morphology and reproductive structures of the selected specimens

Teaching Learning Strategies

- Lectures
- Student Centered approach
- Group Discussion
- Laboratory work
- Seminar/ Workshop

Assignments: Types and Number with Calendar

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

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