**PLANT SYSTEMATICS AND EVOLUTION (PBT-903)**     Credit Hours 3 (3-0)

**Educational Objectives:**

1.      This course will introduce the students with plant taxonomy and plant diversity. The specific objectives include: naming of plants and their classification based on evolutionary relationships, characteristics of plant groups and plant diversity.

**Course Outcomes:**

2.      After taking this course, students are capable to identify the plants by various methods; they are skillful to correctly place them in respective groups. Students are also able to draw their phylogenetic relationships.

3.      **Course Contents:**

      a.      Plant morphology in systematics (especially reproductive structures)
      b.      Pollination biology and plant reproduction
      c.      Plant anatomy in systematics
      d.      Introductory molecular systematics
          (1)     Methods and principles of plant systematics,
          (2)     Nomenclature, specimen preparation, and identification,
      e.      Classification systems of flowering plants,
      f.      Evolution of plant diversity, biodiversity & biogeography,
      g.      Origins of Angiosperms, and phylogenetic relationships of Angiosperms,
      h.      Molecular phylogeny of Plants,
      i.      Role of Chloroplast and nrDNA genes in phylogeny of Plants,
      j.      Molecular identification of plants,
      k.      Bar Code of Plants, Identification of local flora, and Flora of Pakistan.

**Recommended Books:**

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1. Miyamoto, M. and J. Cracraft (eds). 1991. Phylogenetic Analysis of DNA Sequences. Oxford Univ. Press, N.Y.

2. Avise, J. C. 2000. Molecular markers, natural history and evolution, 4th. Edition. Kluwer Academic Publishers. 511 pp.

3. Avise, J. C. 2000. Phylogeography: The history and formation of species. Harvard University Press, Cambridge, MA. 447 pp.

4. Miyamoto, M. and J. Cracraft (eds). 1991. Phylogenetic Analysis of DNA Sequences. Oxford Univ. Press, N.Y.

5. Stace, C. A. 1989. Plant Taxonomy and Biosystematics, 2nd. Ed. Edward Arnold Publ.

6. Soltis, P. S., D. E. Soltis & J. J. Doyle, eds. 1992. Molecular Systematics of Plants. Chapman and Hall, New York. 434 pp.

**7.** Smith, J. M. 1989. Evolutionary Genetics. Oxford University Press, New York, N.Y.