

(Semester IV)

Paper 8: PLANT SYSTEMATICS

THEORY

Unit 1: Plant identification, Classification, Nomenclature; Biosystematics. (2 lectures)

Unit 2: Identification

Field inventory; Functions of Herbarium; Important herbaria and botanical gardens of the world and India; Virtual herbarium; E-flora; Documentation: Flora, Monographs, Journals; Keys: Single access and Multi-access **(6 lectures)**

Unit 3: Systematics- an interdisciplinary science

Evidence from palynology, cytology, phytochemistry and molecular data. **(8 lectures)**

Unit 4: Taxonomic hierarchy

Concept of taxa (family, genus, species); Categories and taxonomic hierarchy; Species concept (taxonomic, biological, evolutionary). **(5 lectures)**

Unit 5: Botanical nomenclature

Principles and rules (ICN); Ranks and names; Typification, author citation, valid publication, rejection of names, principle of priority and its limitations; Names of hybrids. **(9 lectures)**

Unit 6: Systems of classification

Major contributions of Theophrastus, Bauhin, Tournefort, Linnaeus, Adanson, de Candolle, Bessey, Hutchinson, Takhtajan and Cronquist; Classification systems of Bentham and Hooker (upto series) and Engler and Prantl (upto series); Brief reference of Angiosperm Phylogeny Group (APG III) classification. **(8 lectures)**

Unit 7: Biometrics, numerical taxonomy and cladistics

Characters; Variations; OTUs, character weighting and coding; cluster analysis; Phenograms, cladograms (definitions and differences). **(5 lectures)**

Unit 8: Phylogeny of Angiosperms

Terms and concepts (primitive and advanced, homology and analogy, parallelism and convergence, monophyly, Paraphyly and polyphyly). **(5 lectures)**

PRACTICALS

1. Study of vegetative and floral characters of the following families (Description, V.S. flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification):

Ranunculaceae	-	<i>Ranunculus, Delphinium</i>
Brassicaceae	-	<i>Brassica, Alyssum / Iberis</i>
Myrtaceae	-	<i>Eucalyptus, Callistemon</i>
Umbelliferae	-	<i>Coriandrum /Anethum / Foeniculum</i>
Asteraceae	-	<i>Sonchus/Launaea, Vernonia/Ageratum, Eclipta/Tridax</i>
Solanaceae	-	<i>Solanum nigrum/Withania</i>
Lamiaceae	-	<i>Salvia/Ocimum</i>
Euphorbiaceae	-	<i>Euphorbia hirta/E.milii, Jatropha</i>
Liliaceae	-	<i>Asphodelus/Lilium/Allium</i>
Poaceae	-	<i>Triticum/Hordeum/Avena</i>

2. Field visit (local) – Subject to grant of funds from the university.
3. Mounting of a properly dried and pressed specimen of any wild plant with herbarium label (to be submitted in the record book).

ESSENTIAL READINGS

1. Singh, (2012). *Plant Systematics: Theory and Practice* Oxford & IBH Pvt. Ltd., New Delhi. 3rd edition.
2. Jeffrey, C. (1982). *An Introduction to Plant Taxonomy*. Cambridge University Press, Cambridge.
3. Judd, W.S., Campbell, C.S., Kellogg, E.A., Stevens, P.F. (2002). *Plant Systematics-A Phylogenetic Approach*. Sinauer Associates Inc., U.S.A. 2nd edition.
4. Maheshwari, J.K. (1963). *Flora of Delhi*. CSIR, New Delhi.
5. Radford, A.E. (1986). *Fundamentals of Plant Systematics*. Harper and Row, New York.