

**Course title: Introduction to Plant Biology**

Course code: **1BOT10 001T**

Maximum marks: 100

Credit: 4

Total teaching hours: 60

**Course objectives**

This course is aimed to expose students to basic knowledge of biology. It will deal with the life processes including germination, growth, anatomy and differentiation, physiology and metabolism, flowering and fruiting, and biological interactions.

**Learning outcomes**

After completion of course students will be able to describe and appreciate

- 1) The history of plant biology.
- 2) Structure and functions of various parts of plants.
- 3) Types of plant cells and their structure and functions.
- 4) Principles of genetics, physiology and interaction of plants.

**THEORY**

**Unit I: History of plant sciences**

Origin and evolution of botany as a science, History and development of Botany in India and abroad, domestication and origin of agriculture, plants and people.

**Unit II: The Structure of Plants**

Concept of Monocots and dicots- Important characteristics of each; vegetative organs of plants-root, stem and leaf, their structure, modification and functions. Reproductive organs of plants - diversity in inflorescence and flower structure

**Unit III: Plant physiology and development**

Photosynthesis and Respiration, brief account of transport processes (active and passive), water and mineral nutrition

**Unit IV: Genetics and Plant Breeding**

Mendel's genetic experiments on pea, definition of gene and allele; dominant and recessive; phenotype and genotype; homozygous and heterozygous; monohybrid and dihybrid crosses, backcross and test cross; incomplete dominance and co-dominance, a brief introduction to pure lines; concept of inbreeding depression and heterosis; hybridization and hybrid varieties

**Unit V: Plant ecology and conservation**

Ecosystem and its components; definition of population, community, food chain and food

webs; Extinction- human and natural impacts; concepts of RET taxa, hotspots and red data book; brief idea of conservation approaches

### **Suggested Readings**

1. Dickison, W.C. (2000). Integrative Plant Anatomy. Harcourt Academic Press, USA.
2. Fahn, A. (1974). Plant Anatomy. Pergmon Press, USA.
3. Mauseth, J.D. (1988). Plant Anatomy. The Benjamin/Cummings Publisher, USA.
4. Esau, K. (1977). Anatomy of Seed Plants. John Wiley & Sons, Inc., Delhi.
5. Karp, G. (2010). Cell Biology, John Wiley & Sons, U.S.A. 6th edition.
6. Hardin, J., Becker, G., Skirensmith, L.J. (2012). Becker's World of the Cell, Pearson Education Inc. U.S.A. 8th edition.
7. Griffiths, A.J.F., Wessler, S.R., Carroll, S.B., Doebley, J. (2010). Introduction to Genetic Analysis. W. H. Freeman and Co., U.S.A. 10th edition
8. Odum, E.P. (2005). Fundamentals of ecology. Cengage Learning India Pvt. Ltd., New Delhi. 5th edition.
9. Singh, J.S., Singh, S.P., Gupta, S. (2006). Ecology Environment and Resource Conservation. Anamaya Publications, New Delhi, India.

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