

DISCIPLINE SPECIFIC (CORE) COURSE
Semester-V

HSC520C1: LIFE SCIENCES

(CREDITS: THEORY-4, PRACTICAL-2)

THEORY (4 CREDITS)

SECTION: A - BOTANY

Unit 1: Introduction to Plant Kingdom and Anatomy of Plants

- Classification of Plant Kingdom
- Angiospermic plants (Flower with details of its parts)
- Formation of fruit, seed and embryo
- Structure of monocot and dicot seed and seed germination
- Plant cell- structure of chloroplast and cell wall of flowering plants
- Types of plant tissue- meristematic and permanent tissue
 - Simple tissue- parenchyma, collenchyma, sclerenchyma and stomata
 - Complex tissue- xylem and phloem

Unit 2: Propagation of plants – seed and vegetative and Physiology

- Seed Propagation
- Cuttings – stem, leaf and root
- Layering and Grafting
- Important physiological processes (Diffusion , Osmosis and Plasmolysis)
- Ascent of sap. Absorption of water, transpiration
- Brief account of photosynthesis and respiration in plants
- Role of microorganisms in soil fertility (Nitrogen cycle, carbon cycle, sulphur cycle)

SECTION B- ZOOLOGY

Unit 3 Animal Classification, Cell Biology and Applied Zoology

- Classification of animal kingdom
- Chordates up to 5 major classes, characteristics with examples
- Non chordates up to phyla, characteristics with examples
- Cell theory, electron microscopic structure and function of a cell
- Cell division and its significance
- Parasites and human diseases
- Plasmodium, Giardia, Entamoeba, Taenia, Ascaris
- Economics importance and control of common household pests e.g. cockroach, housefly, mosquitoes and termites.
- Identification and control of important stored grain pests

Unit 4 Genetics and Animal Biotechnology

- Basics of Genetics
- Genetic disease and sex linked inheritance
- Importance of Genetic counselling
- Introduction to Stem cell technology
- Cloning
- Transgenic animal and their importance

PRACTICAL

SECTION A- BOTANY

- Study of permanent slides of dicot stem, monocot stem, dicot and monocot root, dorsiventral leaf and iso-bilaterl leaf.
- Propagation of plants by seed and vegetative methods
- Preparation of temporary mounts (a) onion peel, (b) Epidermis of Rhoeo
- Physiology experiments: (a) Photosynthesis (b) Transpiration
- Floral description of few Angiospermic families

SECTION B- ZOOLOGY

- Survey of animal kingdom (2-3 specimens from each class/ phylum)
- Study of cells - neurons, blood cells, cheek cells, Vermi composting

RECOMMENDED READINGS

1. Chadha K.L.2012. Handbook of Horticulture. ICAR Publication.
2. Dutta A. C. Botany for Degree Students 1968, Oxford University Press, New Delhi
3. Gopalaswamianger K.S. 1991, Complete gardening in India, Messers Nagaraj And Co. Madras
4. Hartman H.T.and D. Kester:D. 1986. Plant Propagation, Principles and Practices, Prentice Hall of India Pvt. Ltd. New Delhi.
5. Kochhar P.L. Krishnamoorthy H.N 1984. A textbook of Plant Physiolog. Atma Ram Publishing House.
6. Raven P. and Johnson G. 2010. Biology. McGraw Hill Science.
7. Soni N.K. and Soni V. 2010. Fundamentals of Botany. Tata McGraw Hill Education
8. Jordan and Verma,1998, Invertebrate Zoology, S. Chand and Co. Ltd
9. Kotpal,2000,Modern Textbook of Zoology, Rastogi Publications
10. Winchester, A.M. 1967, Genetics, Oxford and IBH Publishing Company
11. Vijay and Gupta (2011)Applied Zoology, Phoenix Publishing House