Subject Code : P8BI1

CC - I CELL BIOLOGY AND BIODIVERSITY

UNIT – I

Biology of Cells: Prokaryotic and Eukaryotic cells – Cell organelles and its functions - Differences and similarities in plant and animal cells — Cell surface and Cellular interactions - Cell membrane and Permeability: Membrane organization – Membrane proteins - Transport across the plasma membrane - Mechanisms of transport in animals and in vascular plants - Cell Cycle and Cell division (mitosis & meiosis).

UNIT – II

Biological Thermodynamics – Active sites and structure of an Enzyme – Mechanism of an enzyme action - Cell Energetics and respiration: Energy, life's driving force, energy capture – photosynthesis, role of ATP in energy cycle - Fats and protein as alternate energy sources.
Key Biomolecules – lipids, polysaccharides, proteins, and nucleic acids – chemical bonds in biomolecules.

UNIT – III

Overview of protein and nucleic acid structure – Levels of protein structure - α-helix, β-sheet and β-turns –Super secondary structures – Domains - quaternary structure.
DNA and RNA structure - helical structures of DNA - Watson and Crick model – Different forms of DNA - A, B and Z forms - RNA secondary structure - DNA as genetic material, genes in action, gene regulation.

UNIT – IV

Evolution: Concepts and theories of Organic evolution – Mechanisms producing genetic diversity – Origin of species – Hardy-Weinberg equilibrium – Adaptive radiation – Patterns of evolution.
Biodiversity: Genetic, Species and Ecosystem diversity – Values and Uses of Biodiversity – Conservation of Biodiversity – Databases on Biodiversity – Biodiversity and Biotechnology.

UNIT – V

Biology of Environment: Basic ecological principles – Dynamics of an ecosystem –Energy flow in an ecosystem - Community ecology – Human impact on resources and ecosystems - Environmental pollution - Population ecology –Co evolution - Importance of biodiversity in homeostasis of an ecosystem.

Reference Books:

1. E.D.P. De Robertis and E.M.F. De Robertis, Jr., Cell and Molecular Biology, Eighth Edition, B.I. Waverly Pvt Ltd, New Delhi, 1996.

2. Robert H.Tamarin, Principle of Genetics, The McGraw Hill companies, Inc., 1999.
3. Mukherji, S. and Ghosh, A.K., Plant Physiology, Tata McGraw Hill Publishing Company Limited, New Delhi, 1996.
4. Donald T. Haynie, Biological Thermodynamics, Cambridge University Press, 2001.
5. J. M. Berg, J. L. Tymoczko and L. Stryer, *Biochemistry*, 5th edition, W. H. Freeman & Co. New York (2002).
6. J.L. Jain, Fundamentals of Biochemistry, S. Chand & Company LTD, 1999.
7. Krishnamurthy K.V., An Advanced Textbook on Biodiversity – Principles and Practice, Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi, 2003.
8. Jha, A.P. Genes and Evolution, Macmillan India Ltd, 1993.
9. Sharma, P.D., Elements of Ecology, Rastogi Publications, Meerut, 1989.
10. Odum, E.P., Fundamentals of Ecology. W.B.Saunders Company, Philadelphia, 1971.
11. J.L. Chapmann & M.J.Reiss, Ecology- Principles and Applications, Cambridge University Press, 1999.