

**M.Sc., II SEMESTER  
SOFT CORE PAPER -1  
EVOLUTIONARY BIOLOGY.**

**THEORY** **48 Hrs**

**UNIT I** **8 Hrs**

A. Concepts and theories of organic evolution: Pre Darwinian concepts, Darwinism and its impact in the development of synthetic theory.

B. Neodarwinism: Birth of population genetics, Components of population genetics, Mendelian population, gene pool, allele frequencies and genotype frequencies, Models depicting Hardy Weinberg law, Destabilizing forces of evolutionary equilibrium (Mutation, Migration, Selection, Meiotic drive and genetic drift).

**UNIT II** **8 Hrs**

Speciation and evolution: A) Concept of species, B) Types of species C) Models of speciation, D) Patterns and mechanisms of reproductive isolation, E) Hybridization, polyploidy and speciation.

**UNIT III** **8 Hrs**

A) Phyletic gradualism and punctuated equilibrium B) Micro and macroevolution.  
C) Molecular evolution: A) Selectionists theory of evolution, B) Neutral theory of evolution, C) Molecular clock and emergence of non-darwinism,

**UNIT IV** **8 Hrs**

A) Phylogenetic trees : Construction with nucleic acid and amino acid sequences, Types of trees and Techniques employed in construction of phylogenetic trees, C) Molecular phylogenetics of Homo sapiens.

**UNIT V** **8 Hrs**

Population genetics and Evolution- Two locus and multilocus genetics- Linkage disequilibrium- Balanced theory of evolution.

**UNIT VI** **8 Hrs**

Genome and Evolution- Genes and gene clusters- Origin of new genes by gene duplication (Ohno's concept)- Selfish DNA- Karyotypic evolution (*Drosophila*).

**TUTORIALS** **16X2=32 Hrs**

**REFERENCES:**

1. Dobzhansky Th, (1951) Genetics and origin of species, 3rd Edn. Chapman and Hall, London.
2. Dobzhansky Th, Ayala F.J, Stebbins G.L and J.M. Valentine, (1976) Evolution, Surjeet Publication, New Delhi.
3. Futuyama D.J (1986) Evolutionary Biology, Sinuauer Associates Inc. USA
4. Hartl D.L (2000) A primer of population genetics, Sinuauer Associates Inc. USA

5. Jha A.P (1992) Genes and Evolution - John Wiley Publicaion, New Delhi
6. King M (1993) Species evolution - The role of chromosomal change. The Cambridge University Press, Cambridge
7. Mark Ridley (2000) Evolution. Blackwell Science Publications, Cambridge.
8. Merrill D.J (1962) Evolution and Genetics. Holt, Rinehart and Winston, Inc.
9. Smith J.M (1998) Evolutionary genetics. Oxford University Press, Oxford
10. Strickberger M.W (1990) Evolution, Jones and Bertett Publishers, Boston

