Course Title : Evolutionary Biology **Credit: 4 (L-3, T-0, P-1)**

Course Code : **Contact Hrs/Week: (L-3, T-0, P-2)**

Course Outcome (CO)

To illustrate comprehension of ecological and evolutionary mechanisms, encompassing genetic variety, heredity, and natural selection, processes of origins and evolution.

Course Learning Outcomes (CLO): The students will be able to:

1. Understand the basic concepts of evolution and their patterns.
2. Comprehend the evolutionary thoughts and their significance in evolutionary processes
3. Learn about the mechanism of evolution
4. Understand the role of fossils and their study in understanding the evolutionary processes
5. Comprehend the molecular, micro and macro levels of evolution.

UNIT-I

Introduction to Evolutionary Biology. Classification, Phylogeny tree. Patterns of evolution; Origin of life. Experiment of Miller.

UNIT-II

Emergence of evolutionary theories: Lamarck, Darwin's, concepts of variation, Adaptation, struggle, fitness and natural selection; Mendelism; spontaneity of mutations; the evolutionary synthesis.

UNIT-III

Hardy-Weinberg Law, Natural selection, Genetic drift, Role of Migration and Mutation in changing allele frequencies.

UNIT-IV

Paleontology and evolutionary history: The evolutionary time scale; Evolution & fossil record, Geological time scale. Evolution horse and human.

UNIT-V

Molecular Evolution: Concepts of neutral evolution, Molecular tools in phylogeny, Origin of new genes and proteins; micro and macroevolution.

Department of Zoology

Lab component

1. Study of fossils from models/ pictures.
2. Study of homology and analogy from suitable specimens.
3. Study and verification of Hardy-Weinberg Law by chi square analysis.
4. Demonstration of role of natural selection and genetic drift in changing allele frequencies using simulation studies.
5. Graphical representation and interpretation of data of height/ weight of a sample

Suggested readings:

1. Pierce, B. A. (2005). Genetics: A conceptual approach. New York: W.H. Freeman.
2. Hartl, D. L., & Jones, E. W. (1998). Genetics: Principles and analysis. Sudbury, MA: Jones and Bartlett.
3. Tamarin, R. H., & Leavitt, R. W. (1991). Principles of genetics. Dubuque, IA: Wm. C. Brown.
4. Ridley, M (2004) Evolution III Edition Blackwell publishing
5. Hall, B.K. and Hallgrimson, B (2008). Evolution IV Edition. Jones and Barlett Publishers.
6. Campbell, N.A. and Reece J.B (2011). Biology. IX Edition. Pearson, Benjamin, Cummings.