Name of the Programme: M. Sc. Zoology

Course Code: ZOO-628 **Title of the Course:** Evolutionary Biology

Number of Credits: 02

Effective from AY: 2023-24

Pre-requisites for the Course:	Basic working knowledge of diversity, cell biology, genetics and classical evolutionary biology	
Course Objectives:	1. To develop concepts in evolutionary biology of animals and humans 2. To perceive different theories of evolution and their relevant applications 3. To examine the importance of populational genetics in influencing evolution	
Content:	**Module 1** Emergence of evolutionary thoughts, Creation and evolution, Evolutionary theories and evidences: Contributions of Lamarck, Darwin, Darwin-Wallace postulates, concepts of variation, adaptation, struggle, fitness and natural selection; Spontaneity of mutations; The evolutionary synthesis, limitations of Darwinism, Neo Darwinism. Origin of cells and unicellular evolution: Origin of basic biological molecules, Abiotic synthesis of organic monomers and polymers, Concept of Oparin and Haldane, Experiment of Miller (1953), The first cell, Evolution of prokaryotes, Origin of eukaryotic cells, Evolution of unicellular eukaryotes. Paleontology and Evolutionary History: Overview of evidences - Paleontological, Embryological,Comparative morphological, Anatomical, Genetics and Cytological, Molecular Biological evidences. The Evolutionary time scale: Eras, periods and epoch; Major events in the evolutionary time scale; Origins of unicellular and multi cellular organisms; Major groups of plants and animals; Stages in primate evolution including Homo, Human evolution. **Module 2** Population genetics: Populations, Gene pool, Gene frequency; Hardy- Weinberg Law; Evolutionary forces that affect the allelic frequencies: Mutation, Migration, Selection - Stabilizing	15 hours 15 hours

	selection, Directional selection, disruptive selection, Balancing selection, Frequency dependent selection, Density dependent selection, Group and kin selection, Selection coefficient, Selective value, Selection in natural Populations, Genetic drift, Nonrandom mating. Hybridization and speciation: Concept of species and models of speciation based on distribution sympatric, allopatric, stasipatric, genetic drift, genetic revolution, genetic transilience, Founder-flush theory, phylogenetic gradualism, punctuated equilibrium, hybridization, adaptive radiation, isolating mechanisms. Molecular Evolution: Molecular phylogeny, neutral theory, molecular clock.	
Pedagogy:	Use of conventional, online and ICT Methods. Field visit/Case study/ ecotourism project proposal/project/self-study/Lecture/Tutorials/Assignments	
References/ Readings:	1. D.J. Futuyma, Evolution, 3rd ed., New York: Sinauer Associates, 2006, 2. M. Ridley, Evolution, 3rd ed, New York: Wiley-Blackwell Publishers, 2003. 3. M.R. Rose, and L.D. Mueller, Evolution and Ecology of the Organism, New York: Prentice Hall, 2005. 4. N.H. Barton, D.E.G. Briggs, J.A. Eisen, A.E. Goldstein, N.H. Patel, Evolution, New York: Cold Spring Harbor Laboratory Press, 2007. 5. M.W. Strickberger, Evolution, Jones and Bartlett Publishers, Sudbury, 2013.	
Course Outcomes:	The learner will 1. Explain the logical sequence of events of animal and human evolution 2. Correlate the available evidences of evolutionary patterns 3. Integrate the concepts of populational genetics with evolution 4. Predict evolutionary trends in a population of animals	

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