



Master of Science (Zoology)
M.Sc. Zoology Semester I

Course Code	PS01CZOO52	Title of the Course	Evolutionary Biology
Total Credits of the Course	04	Hours per Week	04

Course Objectives:	<ol style="list-style-type: none">(1) To explain historical overview of evolution, Universe and Life(2) To understand the attributes of evolutionary theories such as Lamarckism, Darwinism and Neo-Darwinism.(3) To develop holistic views about Evidences justifying Evolutionary processes(4) To correlate geological time scale with possible mechanisms, events and origin of different species(5) To provide an outline on significance of variations in evolution(6) To impart knowledge on major aspects of Population Genetics through Hardy-Weinberg Law, Genetic Drift and Types of Natural Selection processes(7) To understand patterns of evolution through micro/macro adaptations and speciation(8) To comprehend the interrelationship between brain, behavior, psychology and diversity in humans
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Course Content		
Unit	Description	Weightage* (%)
1.	Introduction to Evolutionary Biology: Importance of evolution in biology Theories- Lamarckism, Darwinism, Neo-Darwinism and Mutation theory, Neutral theory and Modern synthetic theory of evolution Historical overview of Life; Ancient beliefs and recent hypothesis of origin of life, biochemical origin of life, Geological Distribution of animals; Fossils and fossil records	25
2.	Mechanisms of Evolution: Variations, Gene mutations, Chromosomal aberrations, variations in chromosome number, Natural selection, Genetic drift and gene flow Population Genetics: Gene and genotype frequency, Hardy-Weinberg's law, Founder effect Isolating mechanisms: Pre- and Post- reproductive barriers Speciation: Modes of speciation, isolating mechanisms, speciation in time, factors responsible for speciation	25
3.	Patterns of Evolution: Macro and micro-evolution: definitions,	25





	mechanisms and importance; Evidences of evolution and extinctions over the geological period; Adaptations: types of adaptations, co-adaptations Phylogeny: introduction and concepts of phylogeny; Phylogenetic trees, cladistics and phylogenetic reconstructions, hierarchy of species and transitional forms	
4.	Origin and evolution of primates and man: Evolution and adaptation radiation in primates; trends and factors in human evolution, hominid fossils, stages of human evolution, cytogenetic and molecular basis of origin of man, evolution of modern man, association between human brain with communication and speech, language; emergence of culture. Developmental, ecological, behavioral and psychological aspects and challenges to humans; human migration and diversity	25

Teaching-Learning Methodology	Topics will be taught and discussed in interactive sessions using conventional black board and chalk as well as ICT tools such as power point presentations and videos. Practical sessions will be conducted in a suitably equipped laboratory either individually or in groups depending on the nature of exercise as well as availability of infrastructure. Course materials will be provided from primary and secondary sources of information.
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Understand the mystery of origin of universe and humans
2.	Correlate the ancient theories with the modern integrative and synthetic theories of evolution
3.	Learn the significance of variations that may increase or decrease diversity
4.	Get the comprehensive views on Geological time scale and mass extinctions





5.	Acquire knowledge of different patterns of evolutionary mechanisms
6.	Appreciate the complexities of human evolutionary perspectives

Suggested References:

Sr. No.	References
1.	Smith, M., J., (1982). The theory of Evolution. Cambridge University Press, New York.
2.	Fox, W., W., Dose K., (1972). Molecular Evolution and origin of life. W.H.Freeman & Co Ltd, New York.
3.	Rastogi, V., B., (2018). Organic Evolution. 3 rd Edn. Scientific International, New Delhi.
4.	Mayr, E., (1970). Populations, species and Evolution. Harvard University Press, Cambridge.

On-line resources to be used if available as reference material

On-line Resources

Relevant review articles/research papers/handouts of latest development in the subject

