Course Code: ZOC 101 **Course Title: Principles of Animal Systematics**
Number of Credits: 3
Effective from AY: 2020 -21

Prerequisite for the Course:	Basic working knowledge of classical and animal taxonomy and systematics.	
Objectives:	This course develops concepts in animal taxonomy and systematic, modern methods of taxonomy and systematics and their application, General Organization and molecular basis of animal taxonomy.	
Content:	**Module 1**	
	Introduction to taxonomy, stages of taxonomy, importance of taxonomy, rise of taxonomy.	**2 hours**
	Principles and rules of taxonomy, Zoological nomenclature, ICZN regulations, new trends in taxonomy, Zoological classification, problems of taxonomists.	**4 hours**
	Taxonomic collections, identification and description, Taxonomical hierarchy (Linnaean hierarchy), Concepts of Taxon, holotype, paratype, topotype etc.	**4 hours**
	Concept of speciation: Biological, Phylogenetic and Evolutionary.	**2 hours**
	Module 2	
	Morphology based taxonomy, Numerical taxonomy, Immuno-taxonomy, Paleotaxonomy, Cyto-taxonomy and Chemotaxonomy.	**4 hours**
	Molecular basis of animal taxonomy, Genetic polymorphism, electrophoretic variations, amino acid sequencing for variety of proteins, DNA-DNA and DNA-RNA hybridization.	**4 hours**
	Systematics - definition and role in biology, Biological classification, Molecular systematics, DNA finger printing and molecular markers for detection/evaluation of polymorphism, RFLP, RAPD etc.	**4 hours**

	Module 3 Phylogenetics: Introduction; Basic terminology, Homology: Convergence, parallelisms and reversals. Phylogentic groups: monophyly, polyphyly, paraphyly. Construction of Phylogenetic trees, by using Cladistics and Phenetic related methods. Cladistics and Cladogram: Parsimony and finding the shortest trees, rooting trees. Molecular divergence, molecular clock, molecular drive.	**3 hours** **1 hour** **6 hours** **2 hours**
Pedagogy:	Lectures/ tutorials/online teaching mode/self-study.	
Learning Outcome:	1. Understand historical and modern methods of animal classification and systematics. 2. Get acquainted with field techniques for taxonomic study and use of literature and identification key. 3. Familiarise with Molecular basis of animal taxonomy.	
References /Reading:	1. Avise JC (2004), Molecular Markers, Natural History and Evolution, Chapman & Hall, New York. 2. Huston AM (1994), Biological Diversity, Cambridge University Press, Cambridge. 3. Kapoor VC (1983), Theory and Practice of Animal Taxonomy, Oxford & IBH Publishing Co. 4. Kato M (2000), The Biology of Biodiversity, Springer. 5. Mayer E (1971), Elements of Taxonomy, Oxford IBH Publishing company. 6. Simpson GG (2012), Principle of animal taxonomy, Scientific Publishers. 7. Tikader BK (1983), Threatened Animal of India, ZSI publication, Calcutta 8. Wilson EO (1988), Biodiversity, Academic Press, Washington. 9. Wilson EO (1992), The diversity of Life, The College edition W.W. Northem & Co.	