

Credits: 3

Course II. Taxonomy & Evolution (MSCZO - 502)

Syllabus:

Significance and applications of Taxonomy in Zoology. Modern approaches in taxonomy: Chemotaxonomy, Cytotaxonomy, Neotaxonomy and Molecular taxonomy. Dimension of speciation and taxonomic characters. Species concept. Procedures in Taxonomy: Taxonomic procedure, application and rules of International code of zoological nomenclature. Lamarck & Darwinism: Concept, Hardy-Weinberg law of genetic equilibrium and destabilizing forces. Quantifying Genetic Variability: Genetic and Phenotypic variations in populations. Molecular population genetics: Patterns of change in genetic material, significance of molecular variation and Neo Darwinism. Genetics of speciation: Phylogenetic, biological, Isolation, allopatric, sympatric & parapatric speciation. Origin of higher evolution: Gradualism and equilibrium, major trends in higher categories and Micro, Macro and Mega evolution.

UNIT SCHEDULE

Block I: Taxonomy

Unit 1: Concept of Taxonomy

Unit 2: Modern approaches in Taxonomy

Unit 3: Dimension of Speciation and Taxonomic Characters

Unit 4: Procedures in Taxonomy

Block II: Evolution

Unit 5: Neo- Darwinism

Unit 6: Quantifying Genetic Variability

Unit 7: Genetic Speciation

Unit 8: Origin of Higher Evolution

Course II: Taxonomy & Evolution (MSCZO-502)

Block I: Taxonomy

Unit 1: Concept of taxonomy

- 1.1 Objectives
- 1.2 Introduction
- 1.3 Significance of Taxonomy
- 1.4 Applications of Taxonomy
- 1.5 Summary
- 1.6 Terminal Questions and Answers

Unit 2: Modern Approaches in Taxonomy

- 2.1 Objectives
- 2.2 Introduction
- 2.3 Chemotaxonomy
- 2.4 Cytotaxonomy
- 2.5 Neotaxonomy and Molecular Taxonomy
- 2.6 Summary
- 2.7 Terminal Questions and Answers

Unit 3: Dimension of Speciation and Taxonomic Characters

- 3.1 Objectives
- 3.2 Introduction
- 3.3 Dimension of Speciation
- 3.4 Mechanism of Speciation
- 3.5 Species Concept
 - 3.5.1 Species
 - 3.5.2 Category
 - 3.5.3 Concept
 - 3.5.4 Sub-species
 - 3.5.5 Infra species
- 3.6 Theories of Biological Classification
 - 3.6.1 Hierarchy of Categories
- 3.7 Taxonomic Characters
- 3.8 Summary
- 3.9 Terminal Questions and Answers

Unit 4: Procedures in Taxonomy

- 4.1 Objectives
- 4.2 Introduction
- 4.3 Taxonomic procedure
 - 4.3.1 Taxonomic collection
 - 4.3.2 Preservation
 - 4.3.3 Identification
- 4.4 International Code of Zoological Nomenclature (ICZN)
 - 4.4.1 Principals, Application and Rules

- 4.4.2 Zoological Nomenclature and Formation of Scientific Names of Various Taxa
- 4.5 Summary
- 4.6 Terminal Questions and Answers

Block II: Evolution

Unit 5: Lamarck & Darwinism

- 5.1 Objectives
- 5.2 Introduction
- 5.3 Concept & theories of Evolution
- 5.4 Hardy-Weinberg law of Genetic Equilibrium
- 5.5 Detailed account of Destabilizing Forces
 - 5.5.1 Natural Selection
 - 5.5.2 Mutation
 - 5.5.3 Genetic Drift
 - 5.5.4 Migration
- 5.6 Summary
- 5.7 Terminal Questions and Answers

Unit 6: Quantifying Genetic Variability

- 6.1 Objectives
- 6.2 Introduction
- 6.3 Genetic structure of Natural Populations
- 6.4 Phenotypic Variations
- 6.5 Model Changes in Genetic Variation
- 6.6 Summary
- 6.7 Terminal Questions and Answers

Unit 7: Genetics of Speciation

- 7.1 Objectives
- 7.2 Introduction
- 7.3 Phylogenetic, Biological and other Concepts of Species
- 7.4 Isolation
- 7.5 Patterns and Mechanisms of Reproductive Isolation
- 7.6 Models of Speciation
 - 7.6.1 Allopatric
 - 7.6.2 Sympatric
 - 7.6.3 Parapatric
- 7.7 Co-evolution and Sexual Selection, Altruism
- 7.8 Summary
- 7.9 Terminal Questions and Answers

Unit 8: Origin of Higher Evolution

- 8.1 Objectives
- 8.2 Introduction
- 8.3 Phylogenetic Gradualism and Punctured equilibrium
- 8.4 Major Trends in the Origin of Higher Categories

8.5 Micro, Macro and Mega Evolution

8.6 Evolution of Man

8.7 Summary

8.8 Terminal Questions and Answers