**M.Sc. Zoology**

**Program Outcomes (POs)**

Upon completion of the M.Sc. in Zoology, students will be able to:

1. **PO1: Deep Subject Knowledge**  
   Develop advanced understanding of animal biology, ecology, genetics, biotechnology, physiology, immunology, and parasitology.
2. **PO2: Analytical and Research Skills**  
   Apply scientific methodologies and biostatistical tools to design, conduct, analyze, and interpret biological research.
3. **PO3: Laboratory Competency**  
   Gain hands-on experience in advanced lab techniques including molecular biology, bioinformatics, microscopy, electrophoresis, immunoassays, and DNA barcoding.
4. **PO4: Ecological and Evolutionary Insight**  
   Evaluate ecological relationships, evolutionary patterns, biodiversity, and environmental impacts on living systems.
5. **PO5: Application of Modern Biology**  
   Employ knowledge of biotechnology, genetics, and bioinformatics in solving real-world biological, medical, and environmental problems.
6. **PO6: Communication and Teamwork**  
   Present scientific ideas clearly through reports, presentations, and discussions; work collaboratively in teams.
7. **PO7: Professionalism and Ethics**  
   Understand and uphold scientific ethics, environmental sustainability, and biosafety in laboratory and field practices.
8. **PO8: Career Readiness and Lifelong Learning**  
   Prepare for careers in teaching, research, environmental monitoring, healthcare, and allied biosciences, or pursue higher studies and research.

**Program Specific Outcomes (PSOs)**

By the end of the M.Sc. Zoology program, students will be able to:

1. **PSO1:** Demonstrate in-depth knowledge in core areas such as taxonomy, molecular biology, developmental biology, physiology, parasitology, and ecology.
2. **PSO2:** Conduct experimental and field research using modern scientific techniques and equipment in zoological sciences.
3. **PSO3:** Analyze and interpret data using computer applications, statistical methods, and bioinformatics tools.
4. **PSO4:** Apply concepts of genetics, immunology, and biotechnology in health, diagnostics, and therapeutic development.
5. **PSO5:** Contribute to biodiversity conservation, fisheries, aquaculture, and environmental management using scientific knowledge and sustainable practices.
6. **PSO6:** Engage in scientific communication, professional development, and interdisciplinary research with a global outlook.

**Course Outcomes (COs)**

**Semester I**

**Paper I: Biosystematics & Taxonomy**

* CO1: Understand taxonomic principles, classification hierarchy, and typification.
* CO2: Apply ICZN rules for scientific naming and categorization of animals.
* CO3: Use modern taxonomic tools like DNA barcoding and cladistics.
* CO4: Evaluate the role of biosystematics in biodiversity and conservation.

**Paper II: Biotechnology & Genetic Engineering**

* CO1: Explain recombinant DNA technology, gene cloning, and PCR techniques.
* CO2: Demonstrate knowledge of genome libraries, gene editing (e.g., CRISPR), and transgenesis.
* CO3: Apply bioinformatics tools to analyze biological sequences and databases.
* CO4: Understand applications and ethical implications of genetic engineering.

**Semester II**

**Paper I: Molecular Biology**

* CO1: Describe structure and function of nucleic acids and chromosomes.
* CO2: Understand central dogma processes: replication, transcription, and translation.
* CO3: Explain gene regulation, DNA repair, and RNA interference mechanisms.
* CO4: Use molecular biology concepts in CRISPR and gene expression studies.

**Paper IV: Basics of Computer and Biostatistics**

* CO1: Demonstrate basic computer skills including MS Office and Internet use.
* CO2: Apply statistical tools for data analysis and scientific interpretation.
* CO3: Perform hypothesis testing using t-test, chi-square, and ANOVA.
* CO4: Visualize biological data using charts, graphs, and software.