

# Syllabus Pre Ph.D. Course work – **Zoology**

## **Paper –I**

### **Research Methodology & Quantitative Biology**

#### **Unit-I**

- **Literature** : Survey and Resources, abstracts, periodicals, INSDOC services, search engines
- **Computer awareness** : drafting, editing, graphical, statistical and presented
- **Data search and retrieval** : bibliography, biological databases
- **Sequence analysis** : homology search, sequence alignments, phylogenetic analysis.

#### **Unit-II**

- Conceptualization of research problem, selection of model and experiment designing.
- Preparation of research papers, reviews, overviews, dissertations and thesis.
- Overview of different funding agencies & Formulation of research proposal.

#### **Unit-III**

- **Types of data** : Categorical, ordinal, interval and ratio
- **Collection of data** : Different sampling methods
- **Presentation of data** : Summarization, measures of central tendency and dispersion graphical representation

#### **Unit-IV**

- **Relation between variables** : Correlation and regression
- **Inferential and descriptive statistics** : Concept and application
- **Parametric and non parametric tests** : Concept & Application
- **Tests of Significance** : t-test, chi square test, Z-test and F-test
- **ANOVA** : one way and two way

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## **Paper –II**

### **Bioinstrumentation & Research Techniques**

#### **Unit-I**

- **Good Laboratory Practices**
- **Basic Laboratory Methods** : Preparation of Reagents, Chemicals & Buffers
  - (I) Microscopy and Image Analysis
  - (II) Water Purification system
  - (III) Laminar flow
  - (IV) Colorimeter & Spectrophotometer
  - (V) Homogenizers & Centrifuges
  - (VI) Autoclave
  - (VII) pH meter
  - (VIII) Immunohistochemistry

#### **Unit-II**

- (I) Transilluminator
- (II) Blood analyzer
- (III) ELISA
- (IV) HPLC
- (V) In situ hybridization
- (VI) Microtomy, Cryocut
- (VII) Lyophilizer
- (VIII) PCR
- (IX) Cytogenetic Technique

#### **Unit-III**

Research Techniques & methodology along with recent advances in various disciplines of biological sciences

- (I) Helminthology
- (II) Fish Biology
- (III) Toxicology
- (IV) Environmental Biology & Wild-life
- (V) Animal Behaviour

#### **Unit-IV**

- (I) Entomology
- (II) Chronobiology
- (III) Molecular Biology & Genetics
- (IV) Endocrinology
- (V) Protozoology
- (VI) Biodiversity

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