

# **SEMESTER SYSTEM OF M.PHIL ZOOLOGY**

## **SEMESTER – I**

### **Paper – 611**

**(Recent Trends in Zoology)**

**Theory – Compulsory**

**Marks – 80 + 20 (4 CH)**

#### **UNIT-I: BIOPHYSICS AND BIOCHEMISTRY**

Membrane systems and Membrane transport  
Principles of Thermodynamics  
Concept of energy, standard free energy, Free energy hydrolysis of ATP  
Electron Transport System, Oxidative phosphorylation  
Amino group Metabolism  
Oxidation of Fatty acids

#### **UNIT-II : IMMUNOLOGY, BIOTECHNOLOGY AND BIOINFORMATICS**

Major Histocompatibility Complex, Auto immune diseases  
Complement Systems, Cytokines  
Monoclonal antibodies and their applications  
Techniques of Recombinant DNA technology (Blotting Techniques)  
Transfection, Transgenic Animals  
DNA Fingerprinting  
Sequence Analysis (BLAST, FASTA, CLUSTAL)

#### **UNIT –III:PHYSIOLOGY, ENDOCRINOLOGY AND ETHOLOGY**

Homeothermy (Temperature regulation) in mammals  
Hormonal regulation of Reproduction (Ovulation, Implantation, Pregnancy, Parturition, Lactation)  
Mechanism of Hormonal Action and Signal Transduction  
Biological rhythms and factors regulating biological rhythms  
Ageing: causes and theories

#### **UNIT-IV: MOLECULAR BIOLOGY AND CYTOGENETICS**

Ultrastructure of eukaryotic chromosome  
Banding patterns of chromosome  
Chromosomal Diseases in Man  
Transcription in Eukaryotes and Post- transcriptional regulation  
Translation in eukaryotes and Post –translational modifications of polypeptides  
Transposons

# SEMESTER SYSTEM OF M.PHIL ZOOLOGY

## SEMESTER – I

### Paper – 612

#### (Research Methodology - I)

Theory – Compulsory

Marks – 80 + 20 (4 CH)

#### UNIT – I : SCOPE OF RESEARCH AND ETHICS:

Introduction and Scope

Research problem: Identification, Selection, Formulation of research objectives

Research design: Components, Types and Importance

Research ethics, Institutional ethics committee

Plagiarism – Pitfall

#### UNIT – II: TECHNICAL WRITING:

Types of technical documents; Full length research paper, Short / Brief communications, Letters to editor, Book chapter, Review, Conference report, Project proposal

Components of a full length research paper; Title / Topic statement, Abstract/key words, Aims and objectives, Hypothesis building, Rationale of the paper, Work plan, Materials and methodology, Results and discussion, Key issue and arguments, Acknowledgement, Conflict of interest statement, bibliography, Technical Resumes & Cover Letters

Components of a research proposal; Project summary Key words, Origin of the proposal, Major Objectives Methodology, Instrument facility available in the PI's department, Overview of status of Research and Development in the subject, Importance of the proposed project in the context of current status, Bibliography

#### UNIT – III: SCIENTOMETRICS:

How to cite and how to do referencing

Literature search technique, using SCOPUS, Google Scholar, PUBMED, Web of Science, Indian Citation Index, and RG

Styles of referencing; APA, MLA, Oxford, Harvard, Chicago

Annotated bibliography

Tools for citing and referencing, Grammarly, Endnote etc

#### UNIT – IV: PRESENTATION AND COMMUNICATION SKILLS:

Tables, Figures and Pictures using Excel

PowerPoint slide preparation

Preparation of Posters

Electronic submission of manuscripts

Communication skills, oral and poster

# **SEMESTER SYSTEM OF M.PHIL ZOOLOGY**

## **SEMESTER – I**

### **Paper – 613**

#### **(Research Methodology - II)**

**Theory – Compulsory**

**Marks – 80 + 20 (4 CH)**

#### **UNIT – I : IPR AND CYBER LAW:**

Patents

Patent laws, process of patenting a research finding

Intellectual property (IP), Intellectual property right (IPR)

Copyright, Trademarks, GI

Cyber laws

COPE

#### **UNIT – II: QUANTITATIVE DATA ANALYSES:**

Types of data, Data collection - Methods and Tools

Hypothesis testing

Normal and Binomial distributions and their property

Tests of significance: Student t-test, F-test, Chi-square test

Correlation and Regression

ANOVA - One-way and Two-way, Multiple-range test

#### **UNIT – III: COMPUTER FUNDAMENTALS:**

Introduction to MS-Office software: MS-Word (Track change)

MS-Excel

MS-Power Point

MS-Access

Features for Statistical data analysis using computers and software

Microsoft Excel Data Analysis Tool Pak, SPSS

#### **UNIT – IV: ADVANCED TOOLS & TECHNIQUES**

Microscopic techniques – Compound Microscopy, Fluorescence

Microscopic and Electron microscopy

Colorimeter, Spectrophotometer

Principle, protocol and application of Chromatography – GLC & HPLC

Electrophoresis and its application.

PCR, Real time PCR

DNA microarray, DNA sequencing

# SEMESTER SYSTEM OF M.PHIL ZOOLOGY

## SEMESTER – I

### Paper – 614

Marks – 100 (4 CH)

## TEACHING ASSIGNMENT

## SEMESTER – II

### Paper – 621

Marks – 150 + 25+25 (8 CH)

## DISSERTATION

(Thesis + Seminar Presentation of the Thesis + Viva – Voce)

### Books Recommended:

- |  |  |
|--|--|
| Alberts, B., Johnson A., Lewis J, et al. | Molecular Biology of the Cell  |
| Andreoli, T.E, Hoffman, J.F. et al       | Membrane transport process in organized system   |
| Barret, K.E et al.                       | Gangong's Review of Medical Physiology   |
| Baxevanis, A.D. and Ouellete, F.F        | Bioinformatics: A practical guide to the analysis of gene and proteins                     |
| Buranen L and Roy AM                     | Perspective on Plagiarism and intellectual Property in a Post-Modern World                 |
| Campbell RC                              | Statistics for biologists  |
| Cassel P et al.                          | Inside Microsoft Office Professional   |
| Chatwal and Chatwal                      | Instrumentation  |
| Coleman P and Dyson P                    | Mastering Internets  |
| Cooper, Geoffrey M                       | The Cell: A molecular Approach   |
| Cox, M.M and Nelson, D.L                 | Principles of Biochemistry   |
| Epplen,J. And Lubjuhn,T.                 | DNA profiling and DNA Fingerprinting   |
| Gilmore B                                | Plagiarism: why it happens, how to prevent it?   |
| Gralla P                                 | How the Internet Works   |
| Gupta, P.K.                              | Molecular Biology  |
| Gupta, P.K.                              | Biotechnology and Bioinformatics   |
| Guyton and Hall                          | A textbook of Medical Physiology   |
| Habraken J                               | Microsoft® Office 2003 All in one, Microsoft ® Office 2010 in Depth                        |
| Hall, J.E                                | Guyton and Hall : Textbook of Medical Physiology   |
| Kaufman, Myron                           | Principles of thermodynamics   |
| Kothari, CR                              | Research Methodology   |
| Kirby,L.T                                | DNA Fingerprinting: An Introduction  |
| Kreitzman, Leon &Foster, R.              | The Rhythms of Life: The biological clocks that control daily lives of every living thing. |
| Kuby, Janis                              | Immunology   |
| Kumar Anupa P                            | Cyber Law  |
| Kumar, Pranav                            | Biophysics and Molecular Biology   |
| Lewin, B                                 | Genes IX   |
| Lodish, H., Berk,A. et al.               | Molecular Cell Biology   |
| Olander, D.R.                            | General Thermodynamics   |
| Power, C.B.                              | Cell Biology(Vol-II)   |

R Panneerselvam	Research Methodology
Rao, Y.V.C	An Introduction to thermodynamic
Russel	i-Genetics: A molecular approach
Sharma, B.K	Instrumental method of analysis
Shelly GB, Vermaat ME, Cashman TJ	Microsoft® 2007, Introductory Concepts and Techniques.
Shourie, Abhilasha & Chapadgaonkar, Shilpa S.	Bioanalytical techniques
Shukla, A.N.	Textbook of Chronobiology
Singh, B.D. and Singh, R.P.	Biotechnology
Stryer, Lubert	Biochemistry
Tortora, G.J and Derrickson, B.	Principles of Anatomy and Physiology
Voet, D and Voet, J.G	Biochemistry
Vogel, AL	Analytical chemistry
Watson, J.D	Molecular Biology of the Gene
Wilson, K. And Walker, J.	Biochemistry and Molecular Biology