RAIGANJ UNIVERSITY

Department of Zoology

Ph.D./M.Phil. Course Work Syllabus(Zoology) 2017

PAPER-I: RESEARCH METHODOLOGY, COMPUTER APPLICATIONS AND BIOSTATISTICS [50]

1.Research Methodology: [15]

1.1. Research Objectives and Proposal: Introduction to research, Statement of the problem, Problem identification, Criteria for prioritizing problems, Learning objectives, designing and formulation.

1.2. Research Methodology and Work Plan: Major components and outline of the different phases in a research process. Experimental design and methodology, Methods of sampling, time and times of sampling.

1.2. Review of Literature: Uses of literature review and data mining; Sources of information: soft and hard data, Organization of information on index cards, Reference citation.

1.4. Editing and Representation: Word and Data processing, Validation of data, Tabular and Graphical illustration, Figure and Table orientation. Thesis writing, Scientific editing tools, Checking tools for Plagiarism.

2. Computer Applications: [15]

2.1. Tools and its presentations: Features and functions of tools such as, Microsoft Office, Microsoft Word, Microsoft Excel, Power Point, Creation and Presentation by generating charts, graphs (eg., Bar Diagram, Line Diagram, Pie Chart, 3D diagram etc.).

2.2. Spreadsheet tool: Introduction to spread-sheet applications, features and functions using formulae and functions, data storing and maintenance.

2.3. Web Search: Introduction to internet, Use of Internet and WWW using search engines and using advanced search tools.

3. Biostatistics: [20]

3.1. Applications of Computers in Biological Research.

3.2. Measures of Central Tendency and Dispersal.

3.3. Standard Error, Standard Deviation and Level of Significance.

3.4. Regression, Correlation and Matrix analysis.

3.5. t-test, Chi-square test and ANOVA.

3.6. Use of SPSS, PAST, Chi-plot (KY-Plot) etc. for statistical analysis.

3.7. Probit analysis, LC_{50}, and LD_{50}.

PAPER-II: ETHICS IN RESEARCH, RESEARCH TECHNIQUES AND ADVANCES IN ZOOLOGICAL SCIENCES [50]

1. Ethics in Research: [15]

1.1 Intellectual Property Rights (IPR) and Bio-Piracy.
1.2 CPCSEA, Ethics related to animal uses, Bio safety, toxicity grades to chemicals and good lab practices.

2.Reseach Techniques: [15]

2.1 Study on Bio diversity by Shannon-Weiner Index and Simpson's Index study.

2.2 Wetland vegetation sampling and mapping.

2.3 Meteorological tools in environmental and agricultural science.

2.4 Methods to study soil and aquatic fauna.

2.5 Counting of forest animals and conservation techniques.

2.6 Use of techniques in research: Chromatography, Electrophoresis, UV Visible Spectrophotometry, Colorimetry, Fluoroscent Microscopy, Electron Microscopy (TEM and SEM).

3. Advances in Zoological Research [20]

3.1. Environmental Biology and Wildlife Biology:

3.1.1 Environment-Climatic changes and degradation of sustainable development.

3.1.2 Wildlife Protection Act, Protected Area Network, Project Rhinoceros, Endangered species.

3.2. Protozoology, Helminthology and Entomology:

3.2.1 Important human protozoans, pathogenecity and control

3.2.2 Important human helminth parasites, pathogenecity and control

3.2.3 Modern trends in the use of pesticides, recent advances in pest management, insect vectors and their management.

3.3 Bioinformatics and Immunopharmacgnosy:

3.2.1 Immuno-modulation by nutraceuticals and functional foods: Current regulatory environment, Immuno-modulation by natural products, Nutraceutical-drug interactions, Nutraceutical-nutraceutical interactions, Quality control issues.

PAPER III: REVIEW OF PUBLISHED RESEARCH WORKS AND DEVELOPMENT OF A RESEARCH PROPOSAL

III-A Review of published Research Works	**[50]**
III-B Development of a Research Proposal	**[50]**
Total Marks	**200**
