Syllabus for Ph.D. course work in Zoology

Department of Zoology

Vidyasagar University, Midnapore-721 102

Course	Course Name	Marks
Course I	Basic Zoology	50
Course II	Applied Zoology	50
Course III	Research Methodology and Research Ethics	50
Course IV	Submission of assignment: a. Review of literature or data generated on the related research topic b. Power point presentation on a research topic OR Analysis of data using MS-Excel or statistical methods	40 10
	Total:	200

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Course I: Basic Zoology

1. Cloning Vector, YAC, BAC 3L
2. Genetic Diseases 3L
3. RFLP marker and its uses 3L
4. Limbic system 3L
5. Stress physiology 3L
6. Fish and Fisheries resources 3L
7. Classification Scheme of Fishes 3L
8. Aquaculture practices and Animal Nutrition 3L
9. Cells and organs involved in immune system 3L
10. Host-Parasite interaction 3L
11. Vector borne diseases and its management 3L
12. Bacterial Microbiology 3L
    a. Fermentation -benefits, importance and types
    b. Quorum sensing
13. Metapopulation 2L
14. T- cell and B-cell development 3L
15. Basic principle of ecosystem functioning: wetland, coast. Forest 3L
16. Environmental management with special reference to EIA 3L
17. Biodiversity and wildlife conservation 3L

Course II: Applied Zoology

1. Advance electron microscopy 4L
2. Restriction mapping 4L
3. DNA fingerprinting 4L
4. ELISA, Immunohistochemistry 4L
5. Southern blotting hybridization 2L
6. Diagnosis of parasitic diseases 4L
7. Advance technology for the conservation and management of fisheries resources 4L
8. Bioinformatics tools 4L
9. Gene cloning: current perspective 4L
10. PCR: primer designing, methodology and applications 4L
11. Flow Cytometry: concepts and applications 4L
12. Genome editing by Crisper Cas9 4L
13. Biodiversity based biotechnology 4L

Course III: Research Methodology and Research ethics

A. Research Methodology: **25L**

1. Research definition, importance, meaning and characteristic. Steps in research.
2. Research problem: identification, selection and formulation
3. Sampling: definition, theory, types, techniques and steps. Sample size, advantage and limitation of sampling.
4. Data: definition, sources and types. Data collection method. Analysis of data
5. Review of literature and Bibliography
6. Research report: types, contents, styles and steps in drafting. Editing the final draft and thesis writing
7. Significance of Impact factor, citation index, SCI, H-index, SCOPUS

Computer application: **15L**

1. Operating system: latest version of WINDOWS, LINUX
2. Database management system
3. Internet
4. Office management: MS-word, MS- Excel, MS-PowerPoint
5. Software packages: SPSS, R-statistics, MATLAB, EMBOS

Statistics:

1. Normal probability distribution
2. Test for goodness for fit for a proposed distribution
3. Correlation of coefficient: Simple linear, Multiple linear and partial
4. Regression: simple, multiple and stepwise

5. Experimental design. Analysis of variance: model, one or two way ANOVA. Multiple comparison tests

B. Research ethics: 10L

- Research and Publication Ethics (RPE)
- Awareness about the publication ethics and publication misconduct
- Pedagogy

a. Theory:

Philosophy and ethics

Scientific conduct

Publication ethics

b. Practice:

Open access publication

Publication misconduct

Database and Research metrics

Course IV: Submission of assignment

1. A literature of review or data generated on the related research topic be submitted by each scholar duly signed and recommended by the supervisor (s)
2. Power point presentation on a researchable topic (Selected by Supervisor)
3. Analysis of data using MS-Excel or statistical methods