

UNIVERSITY OF CALICUT
DEPARTMENT OF ZOOLOGY
Ph.D (Zoology). Syllabus

Paper I-RESEARCH METHODOLOGY

Unit – 1. Research

- 1.1 Meaning, objectives, types and significance
- 1.2 Identifying gap areas by literature review
- 1.3 Selection of problem, defining the problem
- 1.4 Ethics in Research

Unit – 2. Research design

- 2.1 Principles of experimentation
- 2.2 Formulation of research problem
- 2.3 Design of experiments and testing of hypothesis

Unit – 3. Data collection and analysis

- 3.1 Sources of data – primary, secondary and tertiary
- 3.2 Methods of data collection- sampling methods, sample size, sample error
- 3.3 Data processing and analysis
- 3.4 Statistical analysis: Softwares – SPSS, R- program.

Unit – 4. Scientific documentation

- 4.1 Types of report – technical reports and thesis
- 4.2 Literature collection and documentation
- 4.3 Layout – introduction, review of literature, methods, results, discussion, conclusion, references.
- 4.4 Oral presentation – planning, presentation, technical considerations, power point presentation

Unit – 5. Intellectual property and ethical issues

- 5.1 Intellectual property right and patent law, copy right, royalty
- 5.2 Reproduction of published documents: pattern of citation, style manual for citation, citation index, impact factor, acknowledgement
- 5.3 Plagiarism- softwares for checking plagiarism
- 5.4 Ethical issues: ethical committee in animal experiment and clinical trials

Unit – 6. Computer applications

- 6.1 Using excel for data entry and analysis-data entry, analysis, graphical representation
- 6.2 Reference Management Tools -End note, Zotero.

REFERENCES:

1. Daniel, W. W., 2006. Biostatistics: A foundation for analysis in the Health Sciences (7th edition). John Wiley & Sons, New York.
2. Duncary, P., 2003. Authorizing a Ph.D thesis: How to plan, draft, write and finish a doctoral dissertation. Palgrave Macmillan.
3. Garg, B. L., Karadla, R., Agarwal, F and Agarwal, G. K., 2002. An introduction to Research methodology, RBSA publishers,
4. Kothari, C. R., 2014. Research methodology: Methods and techniques, Third edition. New age International.418P.
5. Leedy, P. D and Ormrod, J. E., 2004 Practical Research: Planning and Design. Prentice Hall.
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8. Satarkar, S.V., 2000. Intellectual property rights and copy right.ESS ESS publications.
9. Sinha, S. C and Dhiman, A. K. 2002. Research Methodology,ESS ESS publications, 2 volumes.
10. The Excel® Analyst's Guide to Access® (2010) by Michael Alexander Publisher: John Wiley & Sons ISBN: 9780470567012
11. Trochim, W. M. K 2006. Research methods: the concise knowledge base, Atomic Dog publishing, 270P.
12. Wadehra, B. I. 2000. Law relating to patents, trademarks, copyright designs and geographical indications. University law publishing.
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FIRST SEMESTER PhD ZOOLOGY DEGREE EXAMINATION, 2019.

Model Question Paper

Paper I-RESEARCH METHODOLOGY

Time: 3 hour

Max marks: 60

(I) Answer any **one** of the following

1. Write an account of intellectual property rights. Add a note on its importance.
2. Explain different types of scientific documentation.
3. Give an account of principles of experimental design.

(1 x15 = 15 marks)

(II) Write short essay on any **two** of the following

4. Give an account of different statistical softwares used in biological research.
5. Explain the factors to be taken in to consideration while preparing and delivering an oral presentation
6. Explain need for preventing plagiarism. What are the softwares used for checking plagiarism?
7. Describe how Excel program is used in data entry and analysis.

(2 x10 = 20 marks)

(III) Write short notes on any **five** of the following

8. Review of literature.
9. Testing of hypothesis.
10. Copy right.
11. Impact factor.
12. Citation index.
13. Royalty.
14. Ethical clearance

(5x5 = 25 marks)