

Syllabus for Ph. D. Course Work

Paper- I: Research Methodology including quantitative methods, computer applications, research ethics, research design, basic Statistics, Biostatistics etc.

Course Contents:

- 1. Research Methodology- an Introduction:**
Meaning and objectives of Research, Motivation in Research, Types of Research, Significance of Research, Criteria of Good Research, Problems encountered by Researchers in India.
- 2. Research Problem:**
Defining the Research Problem, Selecting the Problem, Formulating the Research Questions, Hypothesis and Framing the Objectives of a Research Study.
- 3. Research Design:**
Meaning and need of a Research Design, Features of a good Research Design, Different Research Designs, Basic Principles of Experimental Designs.
- 4. Review of Previous Works and Literature, Methods of Citing the References.**
- 5. Ethical Principles in Biomedical Research.**
- 6. Measurements in Research:**
Scales of Measurements, Sources of Error in Measurements, Reliability and Validity.
- 7. Data Collection:**
Types of Data, Different Methods of Collection of Data, Difference between Schedule and Questionnaire, Framing of Schedule and Questionnaire, Selection of Appropriate Methods for Data Collection.
- 8. Analysis of Data:**
Descriptive Data Analysis Methods, Measures of Relationship- Correlation and Regression Analysis. Basic Concepts of Hypothesis Testing, Procedure for Hypothesis Testing, Statistical Test Procedures- Parametric and Non- Parametric Tests, Choosing the Appropriate Statistical Tests of Significance.
Writing, Types of Reports, Mechanics and Precautions of Writing Research Reports.
- 9. Sample Size and Sampling Methods:**
Importance of Sample Size Calculations, Prerequisites for Sample Size Calculations, Sample Size Calculation Process for Different Study Designs, Requirement of a Good Sample, Sampling and Non-sampling Errors, Different Types of Sampling Methods, Criteria of Selecting a Sampling Procedure.
- 10. Concepts of Meta Analysis and Systematic Review.**
- 11. Interpretation and Report Writing:**
Meaning and Techniques of Interpretation, Significance of Report
- 12. Role of Computers in Research:**
Application of Computers and Software in Research.

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13. Use of internet in research works

Use of internet networks in research activities in searching material, paper downloading, submission of papers in arXiv, use of SPIRES database, relevant websites for journals and arXives.

14. Philosophy and Ethics:

Introduction to philosophy: definition, nature and scope, concept, branches. Ethics: definition, moral philosophy, nature of moral judgements and reactions.

15. Introduction to Patent laws etc.

Patent laws, process of patenting research finding, Copy right, Cyber laws

16. Scientific Conduct

Ethics with respect scientific process, Intellectual Property Right and Integrity of Research, Scientific misconduct: Falsification, Plagiarisms, Redundant publications, Duplicate and overlapping publication, salami slicing. Selective reporting and misrepresentation of data.

17. Publication Ethics

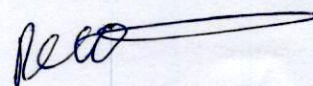
Publication ethics: definition, introduction, and importance. Best practices / standards setting initiative and guidelines: COPE, WAME, etc. Conflict of Interest, Publication misconduct: definition, concept, problems that lead to unethical behaviour and vice versa, types, violation of publication ethics Authorship and contributor ship, predatory publisher, and Journals Use of Plagiarism Software like Turnitin, Urkund and other open-source software tools.

18. PRACTICE

Open Access Publishing: Open access publications and initiatives. SHERPA/RoMEO online resource to check publisher copyright & self-archiving policies. Software tools to identify predatory publications developed by SPPU. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.

19. Database and Research Metrics

Indexing Data base, Citation Data Bases: Web of Science, Scopus, altmetrics etc., Impact Factor of Journals as per citation report SNIP, SJR, IPP Cite Score, h-index, i-10 index, g-index etc.



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