**Course Title: Research Methodology**
**Course Code: PHD800**
**Course Duration: 45-60 Hours**

| L | T | P | Credits |
|---|---|---|---------|
| 4 | 0 | 0 | 4 |

**Objectives:** The major objective of this course is the understanding and application of emerging trends and new skills associated with research. The course will also introduce students to the safeguards against various errors in conducting any research.

**UNIT – A**                                                          13 Hours

Introduction to Research: Meaning of Research, Objectives of Research, Types of Research, Research Approaches, Research Process. Defining the Research Problem: What is a Research Problem? Selecting the Problem, Necessity of Defining the Problem, Review of Literature. Research Design: Meaning of Research Design, Need for Research Design, Features of a Good Design, and Important Concepts Relating to Research Design, Different Research Designs like various experimentation-Quasi, Latin Square, Factorial Design, their uses& methods.

**UNIT-B**                                                           14 Hours

Methods of Data Collection: Collection of Primary Data, Observation Method, Interview Method, Collection of Data through Questionnaires, Collection of Data through Schedules, Some Other Methods of Data Collection, Collection of Secondary Data, Selection of Appropriate Method for Data Collection. Measurement and Scaling: Non-comparative Scaling Techniques, Continuous Rating Scale, Itemized Rating Scale, Non-comparative Itemized Rating Scale Decisions, Multi-item Scales, Scale Evaluation, Choosing a Scaling Technique. Questionnaire & Form Design: Questionnaire & Observation Forms, Questionnaire Design Process.

**UNIT – C**                                                         13 Hours

Sampling design and Procedures: Sample or Census, The Sampling Design Process, A Classification of Sampling Techniques, Choosing Nonprobability Versus Probability Sampling, Uses of Nonprobability versus Probability Sampling. Data Preparation: Editing, Coding, Transcribing. Hypothesis Testing- T-test, Z-test, ANOVA-test, Chi-Square etc.

**UNIT – D**                                                         12 Hours

Organization of Research Report: Types, Structure, Bibliography, References & Appendices. Style Manuals: APA style, MLA style, The Chicago Manual of style etc. Evaluation of Research Report, When and where to publish?, Ethical issues related to publishing, Plagiarism.

**Reference Books:**
1. Kumar, R. Research Methodology: A step-by-step guide for Beginners. London: SAGE, 2005.

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2. Kothari, C. R. Research methodology: Methods & Techniques (Rev. Ed.) New Age International, New Delhi, 2006.
3. Malhotra, N. K. Marketing research: An applied orientation, 6th ed. SaddleRiver, N.J.: Pearson. Additional, 2010.
4. Dowdy, S., Wearden, S. and Chilko, D., Statistics for Research, Wiley Series (2004)

**Course Title: Research and Publications Ethics**
**Course Code: PHD800A**

| L | T | P | Credits |
|---|---|---|---------|
| 0 | 0 | 4 | 2 |

**Objectives:** Focusing on basics of philosophy of science and ethics, research integrity, publication ethics. Hands on sessions are designed to identify research misconduct and predatory publications. Indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor, etc.) and plagiarism tools will be introduced in this course.

## UNIT – A                                                                                          8 Hours

### Philosophy and Ethics

1. Introduction to Philosophy: definition, nature and scope, concept, branches
2. Ethics: Definition, moral philosophy, nature of moral judgments and reactions.

### Scientific Conduct

1. Ethics with respect to science and research
2. Intellectual honesty and research integrity
3. Scientific misconducts: Falsification, Fabrication and Plagiarism (FFP)
4. Redundant publications: duplicate and overlapping publications, salami slicing
5. Selective reporting and misrepresentation of data

## UNIT-B                                                                                            7 Hours

### Publication Ethics

1. Publication ethics: definition, introduction and importance
2. Best practices/standards setting initiatives and guidelines: COPE, WAME etc.
3. Conflicts of interest
4. Publication misconduct: Definition, concept, problems that lead to unethical behavior and vice versa, types
5. Violation of publication ethics, authorship and contributorship
6. Identification of publication misconduct, complaints and appeals
7. Predatory publishers and journals

## UNIT – C                                                                                          8 Hours

### Open Access Publishing

1. Open access publications and initiatives
2. SHERPA/RoMEO online resource to check publisher copyright & self-archiving policies
3. Software tool to identify predatory publications developed by SPPU: UGC-CARE list of journals
4. Journal finder/journal suggestion tools viz. JANE, Elsevier Journal Finder,

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Springer Journal Suggester, etc.

## Publication Misconduct

1. Group discussions
2. Subject specific ethical issues, FFP, authorship
3. Conflicts of interest
4. Complaints and appeals: examples and fraud from India and abroad

**UNIT – D**                                                                                                **7 Hours**

### Software tools

Use of reference management software like Mendeley, Zotero etc. and anti-plagiarism software like Turnitin, Urkund

### Databases and research metrics

1. Databases (4hrs)
2. Indexing databases
3. Citation databases: Web of Science, Scopus etc.
4. Research Metrics (3hrs)
5. Impact factor of journal as per Journal Citation Report, SNIP, SJR, IPP, CiteScore
6. Metrics: h-index, g-index,i-10 index, altmetrics

## Reference Books:

1. Bird, A. Philosophy of Science, 2006.
2. MacIntyre, Alasdair. A Short History of Ethics, London, 1967.
3. Chaddah, P. Ethics in Competitive Research:Do Not get Scooped; Do Not get Plagiarized, ISBN:978-9387480865.
4. National Academy of Sciences. On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition, National Academics Press. 2009.
5. Resnik, D.B. What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. 2011.
6. Bcall,J, Predatory publishers are corruptiong open access, Nature, 489(7415), 179-179. 2012.
7. Indian National Science Academy, Ethics in Science Education, Research and Governanace, 2019.