

Paper Code:

L P C

Paper Title: Research Methodology

3 0 3

INSTRUCTIONS TO PAPER SETTERS:

Maximum Marks:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 20 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 10 marks

UNIT 1

Research Methodology: Objectives and Motivation of Research, Types of Research, Research Approaches, Significance of Research, Research Methods verses Methodology, Research and Scientific Method, Importance of Research Methodology, Research Process, Criteria of Good Research, Problems Encountered by Researchers in India, Benefits to the society in general.

Defining the Research Problem: Definition of Research Problem, Problem Formulation, Necessity of Defining the Problem, Technique involved in Defining a Problem.

Literature Survey: Importance of Literature Survey, Sources of Information, Assessment of Quality of Journals and Articles, Information through Internet, Significance of ISSN, DOI, Impact Factor, Citations.

Literature Review: Need of Review, Guidelines for Review, Record of Research Review.

Research Design: Meaning of Research Design, Need of Research Design, Feature of a Good Design, Important Concepts Related to Research Design, Different Research Designs, Basic Principles of Experimental Design, Developing a Research Plan, Design of Experimental Set-up, Use of Standards and Codes.

Research Report Writing: Format of the Research report, Style of writing report, References/Bibliography/Webliography, Technical paper writing/Journal report writing.

(10Hrs)

UNIT 2

Data Collection: Exploring the data, Description and Analysis of Data, Sample Design and Sampling, Role of Statistics for Data Analysis, Functions of Statistics, Estimates of Population, Parameters, Parametric V/s Non Parametric methods, Descriptive Statistics, Points of Central tendency, Measures of Variability, Measures of relationship, Inferential Statistics-Estimation, Hypothesis Testing, Use of Statistical software.

(10Hrs)

UNIT 3

Data Analysis: Deterministic and random data, Uncertainty analysis, Tests for significance: Chi-square, student's t test, Regression modeling, Direct and Interaction effects, ANOVA, F-test, Time Series analysis, Autocorrelation and Autoregressive modeling. Case Studies of Data Analysis Tool

Research Proposal Preparation: Writing a Research Proposal and Research Report, Writing Research Grant Proposal.

Self Management:- Stress management, Time management, Interpersonal Skill, professional ethics, psychological phases of a PhD process; team work, sense of humor. (10Hrs)

References:

1. C.R Kothari, "Research Methodology, Methods & Technique"; New Age International Publishers, 2004
2. R. Ganesan, "Research Methodology for Engineers", MJP Publishers, 2011
3. Y.P. Agarwal, "Statistical Methods: Concepts, Application and Computation", Sterling Publs., Pvt., Ltd., New Delhi, 2004
4. Vijay Upagade and Aravind Shende, "Research Methodology", S. Chand & Company Ltd., New Delhi, 2009

RESEARCH ETHICS AND IPR

Paper Code:

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3	0	3

Unit-1

Research Ethics: Introduction to Moral theory; Data “Ownership”, publication Ethics, academic Integrity and Stewardship; Conflict of Interest and Collaboration; Honesty, Candor, Compromise and Integrity; Research Regulation; Self- Regulation; Research Misconduct: Fabrication , Falsification, Plagiarism, multiple submission, Publication Practices and responsible authorship, Peer review.

(10 Hrs)

Unit-2

Responsibilities to Society, Science, and Self: Research Involving Human Subjects; Research and Researchers in Society; Conflict of Interest & Commitment, Data Acquisition, Management, sharing and ownership. Intellectual property Rights- What is IP, What are IP Rights, Copy Rights- Distinction between related rights and copyright, Rights covered by copyright, Patent and kind of inventions protected by a patent, Procedure of Patent Registration, case study related to patent.

(10 Hrs)

Unit-3

Ethical Use of Copyrighted Material- Ethical Use of Resources and Information- Ethical Use of School or Company Resources- code of conduct, code of ethics, Ethical Use of Employee and Customer Information, Cheating and Falsifying Information, Computer Hoaxes and Digital Manipulation

Ethical Business Practices and Decision Making- Fraudulent Reporting and Other Scandalous Activities- Sarbanes-Oxley Act of 2002, Ethical e-commerce- Ethically Questionable Products or Services, Workplace Monitoring, Cultural Considerations, Legislation to Protect Intellectual Property Rights

(10 Hrs)

References:

1. Penslar, Robin L. ed.(1995), Research Ethics, Cases and Materials , Bloomington, Indiana, University of Indian Press.
2. Academic Fraud and the honour system
3. On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition (2009)
4. http://ec.europa.eu/research/science-society/document_library/pdf_06/syllabus-on-ethics_en.pdf
5. http://ori.hhs.gov/education/products/montana_round1/issues.html
6. DEBORAH SMITH, Five principles for research ethics, January 2003, Vol 34, No. 1

7. [http://classes.soe.ucsc.edu/cmpe080e/Spring05/projects/ip/The Ethics of Intellectual Property](http://classes.soe.ucsc.edu/cmpe080e/Spring05/projects/ip/The%20Ethics%20of%20Intellectual%20Property)
8. Deborah Morley, Understanding Computers in a Changing Society, 5th edition, Course technology, Cengage learning