

COURSE STRUCTURE
COMMON SYLLABUS FOR ALL Ph.D. SUBJECTS OF COURSE WORK

PAPER-P-1: RESEARCH METHODOLOGY AND COMPUTER APPLICATION

4 Credits, M.M.100

UNIT I

A-Introduction to Research Methodology: Meaning and objectives, motivations in research. Defining the research problems: what is Research Problem, selecting the Problem, Necessity of and Techniques in defining the problem.

B-Types, approaches and significance of research. Research methods and procedure-historical, philosophical, descriptive, experimental, ex-post facto. Research and Scientific Methods, Research Process, Criteria of Good Research.

UNIT II

A-Methods of Data Collection: Collection of Data through questionnaire and Schedules, Collection of Secondary Data, methods and selection of appropriate method for data collection, interviewing. Survey v/s experiment. Classification and tabulation of data. Diagrammatic and Graphical representations of research results

B-Sampling techniques, population and sample. Sampling distributions of sample mean and sample variance from Normal population, chi-Square, *t* and *F*, *Z* distributions and their properties.

UNIT III

A-Analysis of data: qualitative and quantitative methods, statistics related parametric and non-parametric techniques. General or basic principles of design of experiment

B- Various of experimental design. Basic designs-completely randomized design, randomized block design and Latin square design. Factorial experiments

UNIT IV

A-Computer: fundamental, programming language, data representation, application. Systems concepts, Use of computer in data processing and use of statistical software in data analysis. Scientific communications.

B- Importance of publishing research papers, Publishing Research paper: (a) Preliminaries, Format, Choosing Journal, (b) Title, Running Title (c) Authors: Single and Multi authorship (d) Writing Abstract (e) Introduction section (f) Materials and Methods Section (g) Results and discussion (h) Figures: Design Principles, Legends, Table components, Graphs: Types, Style, Tables v/s Graph (i) Acknowledgements (j) References: Different Styles (k) Selecting Keywords (l) Communication with the Editor, Handling Referees' Comments, Galey Proofs. Writing review articles. Preparing and delivering of oral and poster presentations. Standard Abbreviations and Symbols

Suggested Readings

1. Agresti A. 2002. *Categorical Data Analysis*. 2nd Ed. John Wiley.
2. Arnold BC, Balakrishnan N & Nagaraja HN. 1992. *A First Course in Order Statistics*. John Wiley.
3. Huber PJ. 1981. *Robust Statistics*. John Wiley.
4. Johnson NL, Kotz S & Balakrishnan N. 2000. *Continuous Univariate Distributions*. John Wiley.
5. Marek F. 1963. *Probability Theory and Mathematical Statistics*. John Wiley.
6. Rohatgi VK & Saleh AK Md. E. 2005. *An Introduction to Probability and Statistics*. 2nd Ed. John Wiley.
7. Chakrabarti MC. 1962. *Mathematics of Design and Analysis of Experiments*. Asia Publ. House.
8. Cochran WG & Cox DR. 1957. *Experimental Designs*. 2nd Ed. John Wiley.
9. Dean AM & Voss D. 1999. *Design and Analysis of Experiments*. Springer.
10. Dey A & Mukerjee R. 1999. *Fractional Factorial Plans*. John Wiley.
11. John JA & Quenouille MH. 1977. *Experiments: Design and Analysis*. Charles & Griffin.
12. Kempthorne, O. 1976. *Design and Analysis of Experiments*. John Wiley.
13. Khuri AI & Cornell JA. 1996. *Response Surface Designs and Analysis*. 2nd Ed. Marcel Dekker.
14. Montgomery DC. 2005. *Design and Analysis of Experiments*. John Wiley.
15. Raghavarao D. 1971. *Construction and Combinatorial Problems in Design of Experiments*. John Wiley.
16. Design Resources Server. *Indian Agricultural Statistics Research Institute (ICAR), New Delhi-110012, India*. www.iasri.res.in/design.
17. Gomez, K.A. and Gomez, A.A. (1984) *Statistical Procedure for Agricultural Research*, John Wiley and Sons
18. Panse, V.G. and Sukhatme, P.V. (1985) *Statistical Methods for Agricultural Workers*, ICAR Pub.
19. Chandel, SRS 2006 *A Hand Book of Agricultural Statistics*, Achal Prakashan Mandir, Kanpur

PAPER-II : RESEARCH AND PUBLICATION ETHICS Credits-2, M.M.-100

(As per UGC Recommendation)

Modules Theory	Unit title	Teaching Hours	Modules Practice	Unit title	Teaching Hours
RPE-1	Philosophy and Ethics	3	RPE-1	Open Access Publishing	4
RPE-2	Scientific Conduct	5	RPE-2	Publication Missconduct	4
RPE-3	Publication Ethics	7	RPE-3	Database and Research Matrics	7
				Total	30

Unit-I (Theory)

A: Philosophy and Ethics (3 Hours)

Introduction to Philosophy: definition, nature, scope, concept, branches

Ethics: definition, moral philosophy, nature of moral judgment and reactions

B-Scientific Conduct (5 Hours)

Ethics with respect to science and research

Intellectual honesty and research integrity, copyright

Scientific misconduct: falsification, fabrication and Plagiarism (FFP)

Redundant Publication: duplication and overlapping publication n salami slicing

Selective reporting and misrepresentation of data

Unit-II (Theory): Publication Ethics (7 Hours)

A- Publication Ethics: definition, introduction and importance

Best practice/standard setting initiative and guidelines:COPE, WAME, etc.

Conflict and interest

B- Publication misconduct: definition, concept, problems that leads to unethical behaviour and vice versa, type

Violation of publication ethics, authorship and contributorship

Identification of publication misconduct,complaint and appeals

Predatory publisher and journals

Avoiding Plagiarism.Preparing documents for MoUs, Confidentiality Agreements

Unit-III (Practice): (8 Hours)

A- Open access publishing (4 Hours)

Open access publication and initiatives

SHERPA/RoMEOonline resource to check publisher copyright and self-archiving policies

Software tool to identify predatory publication developed by SPPU

Journal finder/journal suggestion tools viz. JANE,Elsevier Journal finder, Springer, Journal Suggester,etc.

B-Publication Misconduct (4Hours)

(i) Group Discussion (2Hours)

Subject Specific Ethical Issues FFP, authorship

Conflict interest

Complaints and appeals: examples and fraud from India and abroad

(ii) Group: Software tools (2 Hours)

Use of plagiarism software like turnitin, Urkund and other open source software tools

Unit-IV (Practice) Database and research metrics (7 Hours)

A. Database (4Hours)

Indexing database

Citation database: web of science, scopus, etc.

B. Research metrics (3 Hours)

Impact factor of Journal as per journal citation report, SNIP,SJR,IPP, Cite Score

Metrics: h-index, g-index, i-10 index, altmetrics