

Research Methods/Tools/ Writing (RTW) Courses

Research Methods/Tools/ Writing (RTW) Course 3a: Advanced Research Methodology

Structure 3: PG Curricular Structure with Research only

Course Title & Code	Credits	Credit Distribution of the Course			Eligibility Criteria	Prerequisite of the course (if any)
		Lecture (30 Hours)	Tutorial (00 Hours)	Practical (00 Hours)		
RTW 3a: Advanced Research Methodology	2	2	0	0	NIL	NIL

Course Objectives:

- To introduce students to the concepts, scope, and ethics of research in Statistics.
- Develop skills for conducting literature reviews, conceptualising research designs,
- Develop understanding of historical and contemporary contexts of statistical contributions in the development of sciences.

Course Learning Outcomes: After successful completion of this course, the students will be able to:

- Understand the process of research and its underlying ethical considerations.
- Conduct literature surveys using primary sources and secondary databases.
- Design and execute a small-scale research project using appropriate statistical methodology.
- Understand evolution of Statistics and appreciate statistical heritage.

Unit I (7 Hours)

Evolution of Statistics as a discipline, Important milestones in statistical research, Contributions of statisticians and statistical institutions in allied sciences, Importance and necessity of ethical considerations in statistical research.

Unit II (9 Hours)

Accessing literature: Manual, Scientific reports and Statistical Database, Electronic: e-journals, e-books, and Online Database, Referencing Style: Modern Language Association (MLA), American Psychological Association (APA), Chicago Manual of Style (Chicago), Harvard

Referencing Style (Harvard), Vancouver Referencing Style (Vancouver). Impact Factor as per Journal Citation Reports (JCR), Scimago Journal Rank (SJR), and cite score. Multi-Criteria Decision-Making (MCDM) methods like Technique for Order Preference by Similarity to Ideal Solution (TOPSIS), Grey Relational Analysis (GRA) etc. Selection of Journals vis-à-vis specific research area/ topic.

Unit III (8 Hours)

Concept of Inductive and Deductive inference in Statistics, Application and formulation of statistical inferences in various research domains, Mode of conducting field research and operationalisation of variables. Textual analysis of sub-topics in analytic research.

Unit IV (7 Hours)

Inverse probability, Iterative techniques as approximation to complex differential and integral forms.

Essential Readings:

1. Cox, D. R. (2006). *Principles of Statistical Inference*, Cambridge University Press.
2. Hald, A. (1999). *A History of Mathematical Statistics from 1750 to 1930*, John Wiley & Sons.
3. Krippendorff, K. (2018). *Content analysis: An introduction to its methodology*, Sage publications.
4. Kumar, R. (2018). *Research Methodology: A Step-by-Step Guide for Beginners*, SAGE Publications.

Suggested Readings:

1. Beveridge, W.I.B. (2017). *The art of scientific investigation*, Edizioni Savine.
2. Chambers, J. (2008). *Software for Data Analysis: Programming with R*, Springer.
3. Ghosh, J.K., Mitra, S.K. and Parthasarathy, K.R. (1992). *Glimpses of India's Statistical Heritage*, Wiley Eastern Limited, New Delhi.
4. Jeffreys, H. (1998). *The theory of probability*, OuP Oxford.