



बिरसा मुंडा ट्रायबल युनिवर्सिटी Birsa Munda Tribal University

राजपिपला, जि० नर्मदा Rajpipla, Dist. Narmda

Established by Tribal Development Department, Govt. of Gujarat

School of Computer Science

M. Sc. (Information Technology) Programme

Subject Code & Name: MITRM206 - Research Methodology

Teaching And Evaluation Scheme:

Teaching Scheme				Examination Scheme			
Credits				Component Weightage			
				CCE		SEE	
L	T	P	Total	TH	PWE	TH	PWE
1	-	1	2	25%	25%	25%	25%

Programme Name	M. Sc. (Information Technology)
Semester	2
Course Code	MITRM206
Course Title	Research Methodology
Course Content Type (Th. / Pr.)	Th. + Pr.
Course Credit	1 + 1
Sessions + Lab Per Week	1 + 2
Total Teaching/ Lab Hours	15+30
* 2 Lab = 1 session	

Learning Objectives

Upon successful completion of this course, students will be able to:

- Understand the research methodology concepts, research design, data collection methods, and hypothesis formulation for conducting effective research studies.
- Apply sampling techniques, report writing practices, and ethical standards in research and publication processes.

Learning Outcomes

After successful completion of this course, students will be able to:



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| <ul style="list-style-type: none"> • Demonstrate the ability to identify research problems, collect and preprocess data, and formulate suitable hypotheses for research work • Develop research reports and publications using proper sampling methods, ethical practices, citation tools, and publication standards |
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CLO – PLO Mapping Matrix

CLO/ PLO	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9
CLO1	2	3	2	2	3	3	1	2	2
CLO2	1	2	1	2	3	3	3	3	3

Detailed Contents

Unit	Topic/Sub Topic	Teaching Hours
I Introduction to Research Methodology, Data collection, Hypothesis	Introduction to Research Methodology: • Meaning and Objectives of Research, • Types of research • Criteria of Good Research Defining Research Problem: • Necessity of defining research problem, • Source of Research Problem • Techniques involved in defining a problem Research design: • Meaning of research design • Need for research design • Features of good design, • Types of research design Methods of Data Collection: • Types of Data • Collection of primary data : (Observation method, Interview method, Collection of data through questionnaire, Collection of data through schedules, Difference between questionnaire and schedules) • Collection of secondary data • Pre-processing and cleaning of data • handling missing data and outliers Hypothesis: • Definition of hypothesis • Characteristics of good hypothesis • Types of hypothesis • Testing hypothesis	15
II Sampling, Report Writing and Ethics while doing Research	Sampling: • Definitions of sampling • Characteristics of good sampling • Advantages and disadvantages of sampling	15

	• Sampling techniques/ methods (probability sampling method, non-probability sampling methods) • Sample design and selection of sampling techniques • Introduction to Small sample tests (t – test, F – test) Report Writing: • Layout of a research report • Characteristics of a good research report • Different steps of report writing • Types of report Research Ethics • Research Ethics and publication ethics • Indexing database and citation database with Mendeley/Zotero • Publication misconduct : Plagiarism, Fabrication, Falsification, Authorship conflict, Redundant Publication, Salami Slicing • Responsible use of AI in research • Copyright and IPR • How to find good publications for research paper to publish, and identifying predatory journals	
Reference Books		
1. Research Methodology Methods & Techniques - C.R.Kothari, New Age International 2. Verma, Videsh & Dheer, Vineet & Singh, Jaykar & Yadav, D. (2022). Textbook on Research and Publication Ethics. 3. Academic integrity and research ethics, University Grants Commission. (2017).		
Web Resources		
1. https://www.scribbr.com/category/methodology/ 2. https://books.google.co.in/books?hl=en&lr=&id=2Ze-EQAAQBAJ&oi=fnd&pg=PA1&dq=research+methodology+introduction&ots=kCywQXomwn&sig=MpMbgQHlgXSoS-Ws-8oO0taEEYA#v=onepage&q=research%20methodology%20introduction&f=false 3. https://researcheracademy.elsevier.com/uploads/2018-02/ethics_a5_booklet_update260617_web.pdf		

L:: Lecture, **T::** Tutorial, **P::** Practical

CCE:: Continuous & Comprehensive Evaluation



(CCE theory includes Mid Semester Examination, Assignment, MCQ Quizzes, Seminar, Reflective Notes, Class Participation, Case Analysis and Presentation, Slip Tests (Announced/ Surprised), Attendance etc. or any combination of these)

PWE: Practical Work Examination

(PWE includes Laboratory Practical Work, Project Work, Viva simulation exercise work etc.)

SEE:: Semester End Evaluation

Sample Programming Exercises based on MITRM206 Research Methodology

1. Design and create an online survey questionnaire using Google Forms
2. Collect primary data through online survey tools and export responses for analysis.
3. How to retrieve secondary data from open data repositories and research databases.
4. Detect and handle missing values using Excel or SPSS statistical tools.
5. Standardize and transform inconsistent data formats (dates, text, numerical values, etc.) using Excel.
6. Identify and treat outliers in a dataset using descriptive statistical methods.
7. Apply data filtering, sorting, and categorization techniques to prepare data for analysis.
8. Visualize collected data using charts, graphs, and dashboards using statistical methods.
9. Document data collection procedures and prepare a data quality assessment report.
10. Search and retrieve research articles using Google Scholar.
11. Create and manage a personal reference database using Mendeley.
12. Import research articles from online databases and organize them using folders, tags, and collections.
13. Generate in-text citations and bibliographies in APA, IEEE, MLA, and Chicago citation styles.
14. Analyze a research paper to identify ethical and unethical research practices.
15. Examine case studies involving plagiarism, fabrication, falsification, and authorship conflicts.
16. Use plagiarism detection tools and interpret similarity reports.
17. Compare original and plagiarized content or AI generated content and prepare a plagiarism analysis report.
18. Compare journals using Impact Factor, CiteScore and h-index metrics.
19. Assess journal websites using established criteria for detecting predatory publishing practices.
20. Evaluate journal quality using indexing information, peer-review policies, and publication metrics.
21. Prepare a journal selection report for publishing a research manuscript.
22. Identify suitable journals for publication based on research domain and scope.
23. Create and maintain researcher profiles using ORCID, Google Scholar, and ResearchGate.
24. Develop a research publication plan including journal selection, citation management, and ethical compliance.

