GANPAT UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

Programme	Master of Technology	Branch/Spec.	Computer Engineering (Artificial Intelligence)
Semester	I	Version	1.0.0.0
Effective from Academic Year	2025-26	Effective for the Batch admitted in	July 2025
Course Code	3CEAI102	Course Name	Research Methodology & Ethics

Teaching Scheme						Examination Scheme (Marks)			
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	-	-	1	-	1	Theory	-	-	-
Hours	-	-	2	-	2	Practical	30	20	50

Pre-requisites

Basic knowledge of technical research.

Course Outcomes

On successful completion of the course, the students will be able to:

CO1	Understand Research Basics.
CO2	Formulate Research Problems.
CO3	Analyze & Interpret Data.
CO4	Apply Qualitative Methods.

Theory Syllabus

NA

Practical Content

Unit	Content	Hrs.
1	**Introduction:** Definitions and objectives of research, types of research, research approaches, significance of research and main components of the research process.	04
2	**Defining the research problem:** Reviewing the literature (using AI-based literature review tools), framing the research problem, hypothesis, research question formulation using AI tools.	04
3	**Data collection, analysis and interpretation:** Designing of experiments, Data types, Methods of data collection (including AI-assisted data collection tools), Repeatability, Reproducibility and reliability, Sampling methods, Statistical analysis, displaying the data, Research Tools for Qualitative Data Analysis.	06
4	**Qualitative research methods and tools:** Types: Phenomenology, ethnography, grounded theory, case study, historical, narrative; tools.	04
5	**Scientific writing:** Types of scientific reports, structure and components of conference and journal articles and theses, arts of writing, ethics and scientific conduct, ethics in life science studies, plagiarism, copyright, intellectual property rights, LaTeX, advanced AI-based writing tools (e.g., GPT models), collaborative writing platforms, & reference management Software.	06
6	**Research Paper:** Choose a topic, find information (using AI-powered search engines), state your thesis, make a tentative outline, write your first draft (using AI writing assistants), revise your outline and draft, type final paper, integrating feedback from AI-based grammar and style checkers (e.g., Grammarly), Collaborative writing tools (e.g., Overleaf, Google Docs)	04
7	**Tutorials** General tutorials on research methods and tools, hands-on sessions on AI tools for research, workshops on ethical use of AI in research.	02

Text Books

1	Research methodology: Methods and Techniques By C. R. Kothari, New age International
2	Research methodology a step-by-step guide for beginners By R. Kumar, Sage Publications

Reference Books

1	Research methodology and scientific writing By C.G. Thomas, Ane books, Delhi
2	Research Design: Qualitative, Quantitative, and Mixed Methods Approaches By John W. Creswell
3	Research Methodology in the Social, Behavioural and Life Sciences Designs, Models and Methods By H. J. Ader and G. J. Mellenbergh, Sage Publications.
4	LaTex Tutorials (Online Resources)
ICT/MOOCs Reference	
1	https://nptel.ac.in/courses/121106007
2	https://www.coursera.org/learn/research-methodologies
3	https://www.edx.org/learn/engineering/delft-university-of-technology-multidisciplinary-research-methods-for-engineers

Mapping of CO with PO and PSO:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	2	1	1	1	0	0	0	0	0	0	3	1	0
CO2	0	3	2	2	0	1	1	0	0	0	0	3	0	1
CO3	0	0	3	3	2	0	0	1	0	0	0	0	3	2
CO4	0	0	0	3	1	2	2	0	2	0	0	3	2	0