

Programme Name	
Course Code	
Course Title	Research Methodology – Part 1 (Semester I)

➤ **COURSE OUTCOMES**

After completion of the Course, the student should be able to -

1. Explain the fundamental concepts, types, and overall process of research.
2. Formulate a research problem and conduct a systematic literature review.
3. Design an appropriate research methodology and select suitable data collection methods.
4. Apply ethical academic writing practices and standard referencing/citation styles in research documentation.

➤ **COURSE CONTENTS**

01. Introduction to Research

(5 hrs)

Meaning, definitions and characteristics of research, types of research (basic, applied, exploratory, descriptive), quantitative vs. qualitative approach, overview of the research process, importance of research in academics and industry, role of inductive and deductive reasoning in research.

02. Research Problem Formulation & Literature Review

(7 hrs)

Identifying and defining a research problem, formulating research questions and objectives, scope and limitations, literature survey techniques, information sources (books, journals, databases), the literature review process, citation indexes, avoiding plagiarism.

03. Research Design & Data Collection

(7 hrs)

Types of research design (exploratory, descriptive, experimental), variables and hypotheses, sampling techniques and sample size, primary vs. secondary data, data collection tools (questionnaire, interview, observation), reliability and validity of instruments.

04. Academic Writing, Referencing & Research Ethics

(5 hrs)

Structure of a research report, technical writing skills, citation styles (APA, IEEE, MLA), plagiarism and its detection, research ethics and integrity, authorship & publication ethics.

Total: 24 hours

➤ **RECOMMENDED READING**

1. Research Methodology: Methods and Techniques, C.R. Kothari, 3rd Edition.
2. Research Methods for Business Students, Mark Saunders, Philip Lewis and Adrian Thornhill, 8th Edition.
3. Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, John W. Creswell, 5th Edition.

Programme Name	
Course Code	
Course Title	Research Methodology – Part 2 (Semester II)

➤ **COURSE OUTCOMES**

After completion of the Course, the student should be able to -

1. Apply basic statistical techniques for the analysis and interpretation of research data.
2. Perform hypothesis testing and correlation/regression analysis on research data.
3. Prepare and present a research /report following standard scientific writing conventions.
4. Understand the basics of IPR, the patenting process, and research ethics.

➤ **COURSE CONTENTS**

01. Basic Statistics for Research (7 hrs)

Measures of central tendency and dispersion (mean, median, mode, standard deviation), basics of probability, sampling distributions, graphical and numerical representation of data, use of spreadsheet/statistical tools for data analysis.

02. Hypothesis Testing & Correlation-Regression Analysis (7 hrs)

Concept of hypothesis testing, null and alternate hypotheses, level of significance, introductory t-test and chi-square test, correlation analysis, simple linear regression, interpretation of results.

03. Research Paper Writing & Presentation (7 hrs)

Structure of a research paper (abstract, introduction, methodology, results, discussion, conclusion), preparing tables and illustrations, oral presentation skills, poster preparation, effective communication of research findings.

04. IPR, Patents & Research Ethics (3 hrs)

Introduction to Intellectual Property Rights, types of IP (patents, copyrights, trademarks), basics of patent search and filing process, plagiarism and research misconduct, ethical publishing practices.

Total: 24 hours

➤ **RECOMMENDED READING**

1. Research Methodology: Methods and Techniques, C.R. Kothari, 3rd Edition.
2. Research Methods for Business Students, Mark Saunders, Philip Lewis and Adrian Thornhill, 8th Edition.
3. Research Design: Qualitative, Quantitative, and Mixed Methods Approaches, John W. Creswell, 5th Edition.

PROPOSED BY:

Sign: Name: Swanandi Wagh Research and Innovation Club	Sign: Name: Stesha Parkhe IEEE Student Chapter, VJTI
---	---

THROUGH:

Sign: Name: Gargi Gupta / Dev Mishra General Secretary, Academic Vertical	Sign: Name: Jessica Jejoe / Tanush Lokhande General Secretary, Technical Vertical
--	--

Sign: Name: Dr. Vinod B. Suryawanshi Faculty Adviser, Research and Innovation Club, VJTI	Sign: Name: Dr. Ayush Saxena Faculty Adviser, IEEE Student Chapter, VJTI
---	---

Sign: Name: Dr. Neha Mehra Chairperson, Academic Vertical	Sign: Name: Dr. Mandar V. Tendolkar Chairperson, Technical Vertical
--	--

Sign: Name: Dr. Mandar V. Tendolkar / Dr. Shraddha Suratkar Associate Dean, Student Affairs	Sign: Name: Dr. Suranjana Gangopadhyay Dean, Student Affairs
--	---

TO (FOR APPROVAL):

Sign: Name: Dr. K. K. Sangle Designation: Dy. Director, VJTI - for approval
--