Course Description Form

1. Course Name:

Research Methodology

2. Course Code:

3. Semester / Year:

Second Semester 2025–2026

4. Description Preparation Date:

1–2–2026

5. Available Attendance Forms:

Traditional Attendance (in-person), Blended Attendance

6. Number of Credit Hours (Total) / Number of Units (Total)

7. Course administrator's name (mention all, if more than one name)

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8. Course Objectives

Course Objectives	□ Develop a structured understanding of scientific research beyond implementation, emphasizing knowledge generation rather than system development. □ Enable students to distinguish between engineering solutions and scientific contributions. □ Train students to formulate clear research problems and research questions based on knowledge gaps. □ Introduce principles of experimental design, variables, and research validity. □ Equip students with skills in scientific writing, argumentation, and critical evaluation of research work. □ Enhance awareness of ethical research practices and academic integrity.

9. Teaching and Learning Strategies

Strategy	• **Conceptual Lectures:** Focus on understanding scientific reasoning, not only procedures. • **Analytical Discussions:** Evaluate real research papers to identify strengths and weaknesses. • **Hands-On Activities:** Apply research tools (Overleaf, EndNote, Excel) in practical scenarios. • **Problem-Based Learning:** Guide students to define research problems and design solutions. • **Mini Research Tasks:** Encourage students to think critically and justify methodological choice

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Introduction to Research Methodology	Overview of Research Process	Lectures	Class Participation
2	2	Problem Identification and Objectives	Defining Research Problems	Lectures and Activities	Assignment
3	2	Literature Review Techniques	Finding and Analyzing Sources	Lectures and Labs	Research Article Analysis

4	2	Research Design Basics	Types of Research Designs	Lectures	Quiz
5	2	Data Collection Methods	Surveys, Interviews, and Experiments	Hands-On Lab	Assignment
6	2	Introduction to Overleaf	Writing Research Papers with LaTeX	Lab	Lab Exercise
7	2	LaTeX Basics	Document Formatting in Overleaf	Lab	Lab Exercise
8	2	Advanced LaTeX Features	Tables, Figures, and Citations	Lab	Assignment
9	2	Advanced Office Tools	Excel for Data Analysis, PowerPoint for Presentation Design	Lab	Assignment
10	2	Managing References	Using EndNote	Lab	Assignment
11	2	Qualitative Research Techniques	Content Analysis, Case Studies	Lectures and Labs	Lab Exercise
12	2	Writing the Research Proposal	Proposal Structure and Presentation	Lab	Proposal Submission
13-14	4	Research Project Work Sessions	Developing and Finalizing Projects	Guided Labs	Project Feedback
15	2	Final Presentations	Research Findings and Discussion	Presentations	Grading and Feedback

11. Course Evaluation

- 20% for the formal final written exam
- 20% for practical assignments and lab exercises
- 60% for the final project evaluation

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	"Research Design: Qualitative, Quantitative, and Mixed Methods Approaches" by John W. Creswell Focus: Comprehensive overview of research designs and methodologies.
Main references (sources)	The Craft of Research" by Wayne C. Booth, Gregory G. Colomb, and Joseph M. Williams Focus: Practical advice on crafting strong research papers.
Recommended books and references (scientific journals, reports…)	• Journal of Research Methodology • Articles on advances in qualitative and quantitative research methods.
Electronic References, Websites	Overleaf (https://www.overleaf.com) Collaborative LaTeX editor for writing and formatting research papers.