



Gyanmanjari
Innovative University

Course Syllabus
Gyanmanjari Institute of Technology
Semester-4(B.Tech.)

Subject: Research and Publication - BETXX14214

Type of course: Ability Enhancement Course

Prerequisite: Basic knowledge of report writing and familiarity with academic disciplines.

Rationale:

This course provides engineering students with the foundational knowledge to conduct systematic research and solve technical problems. It enhances critical thinking by introducing research types, methodologies, and design approaches tailored to engineering contexts. Students learn data collection and analysis techniques, enabling them to draw meaningful conclusions for practical applications. Academic writing and publication skills are emphasized to prepare them for contributing to scientific advancements. A strong focus on research ethics ensures academic integrity and professionalism. Overall, the course builds essential competencies for innovation, lifelong learning, and success in engineering careers.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks					Total Marks
CI	T	P		C	Theory Marks		Practical Marks		
			ESE		MSE	V	P	ALA	
2	0	0	2	60	30	10	00	50	150

Legends: CI-Classroom Instructions; T – Tutorial; P - Practical; C – Credit; ESE - End Semester Examination; MSE- Mid Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.



Course Content:

Unit No	Course content	Hrs.	% Weightage
1	<p>Fundamentals of Research: -</p> <p>Introduction to Research: Definition, objectives, and significance. Types of research: Basic, applied, exploratory, descriptive, and experimental.</p> <p>Research Process: Identification of research problem. Formulating research questions and objectives.</p> <p>Literature Review: Importance of literature review. Sources of literature: Books, journals, and online databases.</p>	8	25
2	<p>Research Design and Methodology</p> <p>Research Design: Exploratory, descriptive, and experimental designs. Case study and longitudinal research.</p> <p>Data Collection Methods: Qualitative methods: Interviews focus groups, and observation. Quantitative methods: Surveys, experiments, and secondary data sources.</p> <p>Sampling Techniques: Probability and non-probability sampling. Determining sample size.</p>	8	25
3	<p>Data Analysis and Interpretation</p> <p>Data Processing: Coding, editing, and cleaning of data.</p> <p>Data Analysis Techniques: Qualitative: Thematic analysis, content analysis. Quantitative: Descriptive and inferential statistics, regression, and hypothesis testing.</p> <p>Tools for Analysis: Introduction to software like SPSS, MS Excel.</p> <p>Interpreting Results: Presenting findings effectively.</p>	7	25
4	<p>Writing, Publishing, and Ethics</p> <p>Academic Writing: Structure of a research paper: Abstract, introduction, methodology, results, discussion, and conclusion. Referencing and citation styles (APA, MLA, Chicago, etc.).</p> <p>Publication Process: Selecting journals and understanding indexing (Scopus, Web of Science, etc.). Peer review process and addressing reviewers' feedback.</p> <p>Research Ethics: Plagiarism and its implications. Ethical considerations in research and publication.</p>	7	25



Continuous Assessment:

Sr. No	Active Learning Activities	Marks
1	<p>Literature Review Compilation: Students will select a research topic of their interest, search for three relevant journal articles, and compile a summary highlighting the research objectives, methods, and findings of each article. Students will organize their summaries into a single PDF and upload it on the GMIU Web Portal.</p>	10
2	<p>Data Collection on Selected Topic: Select a relevant engineering topic and gather data from reliable sources (journals, reports, databases). Organize the data into a clear format such as tables or graphs. Ensure the data is accurate and relevant to your topic. Submit your compiled data and findings in a PDF document. Upload the file to the GMIU Web Portal.</p>	10
3	<p>Drafting a Research Abstract: Students will draft a 200-word abstract for a hypothetical research study based on a topic of their choice, including the objective, methodology, and expected outcomes. Students will submit the abstract as a PDF document and upload it on the GMIU Web Portal.</p>	10
4	<p>Identifying Top Engineering Journals: Find 10 top engineering journals in your field. For each journal, provide the journal name, impact factor, ISSN number, publisher, and the area of focus. Use databases like Scopus, Google Scholar, and Web of Science to gather this information. Compile your findings in a tabular format or brief report. Submit the completed list as a PDF on the GMIU Web Portal.</p>	10
5	<p>Proper Referencing of Research Papers: Select a research paper from an engineering journal and provide the correct reference in APA, IEEE, and Harvard citation styles. Ensure all necessary details (author, title, journal name, volume, pages, year) are included. Submit your references in a PDF document. This exercise will help you develop accuracy in academic referencing. Upload the document to the GMIU Web Portal.</p>	10
Total		50



Suggested Specification table with Marks (Theory):60

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	30%	30%	20%	10%	-	10%

Course Outcome:

After learning the course, the students should be able to:	
CO1	Understand the definition, types, processes, and significance of research, as well as the importance of literature review in engineering.
CO2	Apply research designs, data collection methods, and sampling techniques to engineering research, ensuring appropriate sample size determination.
CO3	Process, analyze, and interpret data using qualitative and quantitative techniques, and present findings using tools like SPSS and MS Excel.
CO4	Write, publish, and follow research ethics, including paper structure, citation styles, journal selection, peer review, and plagiarism considerations.

Instructional Method:

The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory

The internal evaluation will be done on the basis of Active Learning Assignment

Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in laboratory.



Reference Books:

- [1] Creswell, J.W. Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. SAGE Publications.
- [2] Kothari, C.R. Research Methodology: Methods and Techniques. New Age International Publishers.
- [3] Bell, J. & Waters, S. Doing Your Research Project: A Guide for First-Time Researchers. Open University Press.
- [4] Guthrie, G. Basic Research Methods: An Entry to Social Science Research. SAGE Publications.
- [5] Smith, J. A. Qualitative Psychology: A Practical Guide to Research Methods. SAGE Publications.

