

## UNIT-1

- ✓ Apply the concept of research objectives to define why clarity of objectives is essential in a research proposal.
- ✓ Differentiate between fundamental and applied research with one computing example each.
- ✓ Explain how hypothesis formulation guides experimental research.
- ✓ Identify one ethical concern that may arise in computing research and suggest a preventive measure.
- ✓ Analyze the role of literature review in developing a good research design.
- ✓ Apply the criteria of good research to judge whether a study with poor data reliability is valid.
- ✓ Compare descriptive and experimental research based on data collection techniques.
- ✓ Explain how plagiarism violates academic integrity in research.
- ✓ Apply the concept of research ethics to the use of AI-generated data in computing.
- ✓ Analyze how reproducibility contributes to research quality.
- ✓ Apply the steps of research methodology to design a small computing research project on cloud security.
- ✓ Analyze the difference between applied and fundamental research in terms of objectives, outcomes, and utility.
- ✓ Apply the principles of good research to evaluate a case study where data sources were inconsistently cited.
- ✓ Analyze the significance of ethics in research publication and data sharing.
- ✓ Apply descriptive research methods to study software usability in a real-world scenario.
- ✓ Analyze the challenges researchers face in maintaining academic integrity when collaborating online.
- ✓ Apply experimental research design to test the performance of two machine learning algorithms.
- ✓ Analyze how the objectives of applied research drive innovation in computing fields like AI and IoT.
- ✓ Apply ethical guidelines to evaluate a computing case study involving user data privacy.
- ✓ Analyze the impact of research misconduct on institutional reputation and knowledge credibility.
- ✓ Apply the research process to design a comprehensive study on cybersecurity threats in e-commerce systems.
- ✓ Analyze the interrelationship between research problem identification, objectives, and hypothesis formulation.

- ✓ Apply various research types (fundamental, applied, descriptive, experimental) to examples in computing.
- ✓ Analyze how adherence to ethical principles enhances trust and validity in research outcomes.
- ✓ Apply the criteria of good research to critically evaluate a published computing research paper.
- ✓ Analyze a real-world computing case study (e.g., data breach analysis) using the research framework approach.
- ✓ Apply experimental design principles to develop and test a new algorithm for data compression.
- ✓ Analyze how research ethics guide decision-making in projects involving human–computer interaction.
- ✓ Apply knowledge of descriptive research to create a survey-based study on students' perception of AI tools in learning.
- ✓ Analyze the role of academic integrity in sustaining innovation and collaboration in computing research communities.

## UNIT-2

- ✓ Apply the concept of a research gap to explain why identifying it is critical before defining a problem.
- ✓ Analyze how a poorly defined problem can affect the outcome of research.
- ✓ Apply one example of a hypothesis in computing and identify its type.
- ✓ Differentiate between a null hypothesis and an alternative hypothesis using a simple example.
- ✓ Apply the idea of exploratory design to a situation where little prior research exists.
- ✓ Analyze how simulation-based studies differ from experimental research in terms of control and realism.
- ✓ Apply the distinction between primary and secondary data sources with one computing-related example.
- ✓ Analyze the purpose of hypothesis testing in validating research outcomes.
- ✓ Apply the concept of problem identification to a current issue in data security.
- ✓ Analyze the importance of aligning research design with research objectives.
- ✓ Apply the process of research gap analysis to identify a potential study area in cloud computing.
- ✓ Analyze how a well-formulated hypothesis contributes to effective experimental design.
- ✓ Apply different research designs to study user experience in a new mobile application.

- ✓ Analyze the strengths and limitations of using simulation-based research in computing.
- ✓ Apply steps in hypothesis testing to a small dataset for software performance comparison.
- ✓ Analyze the relationship between problem identification and research objectives.
- ✓ Apply primary and secondary data sources to study e-learning adoption trends.
- ✓ Analyze how the choice of data source can affect research reliability and validity.
- ✓ Apply exploratory research design to a new area such as quantum computing.
- ✓ Analyze the challenges faced in converting a research problem into testable hypotheses.
- ✓ Apply a systematic approach to identify a research problem, conduct a gap analysis, and formulate objectives in the field of cybersecurity.
- ✓ Analyze how hypothesis formulation and testing guide decision-making in experimental computing research.
- ✓ Apply different research designs (exploratory, experimental, simulation) to various phases of software engineering research.
- ✓ Analyze a real-world computing research case study to identify how the research gap was established.
- ✓ Apply hypothesis testing techniques to evaluate the accuracy of two machine learning models.
- ✓ Analyze how improper data source selection can compromise the integrity of research results.
- ✓ Apply exploratory research methods to investigate the impact of AI tools on student learning behavior.
- ✓ Analyze how simulation-based studies can complement experimental research in complex system design.
- ✓ Apply the process of research problem formulation to design a study on data privacy in IoT environments.
- ✓ Analyze how each stage — problem identification, gap analysis, hypothesis, and design — contributes to coherent research methodology.