AI Research Paper Project

Evaluation Framework & Marking Rubric

Course: Artificial Intelligence (BCS, BSSE, BSAI)
Total Marks: 80

- **Mid Examination:** 30 Marks
- **Final Examination:** 50 Marks
  Duration: 16 Weeks
  Group Size: 1 or 2 Students

I. PROJECT STRUCTURE OVERVIEW (16-WEEK PLAN)

The research project is structured progressively to simulate a real academic research process. Students are required to work in pairs and develop a research paper suitable for journal submission.

Phase 1: Foundation & Proposal (Weeks 1–4)

- Group formation
- Topic selection
- Research proposal submission

Phase 2: Conceptual Development (Weeks 5–8)

- Introduction
- Literature review writing
- Research gap identification
- Methodology design

Phase 3: Implementation & Analysis (Weeks 9–13)

- Dataset preparation
- Model implementation
- Experiments and evaluation
- Results interpretation

Phase 4: Finalization & Submission (Weeks 14–16)

- Paper writing completion
- Journal formatting
- Plagiarism check
- Journal submission

II. MID EXAMINATION (30 MARKS)

Submission Requirement:

Hard copy submission containing:

- Introduction
- Literature Review
- Methodology
- References

Detailed Rubric – 30 Marks

1. Introduction Quality (5 Marks)

Purpose:
To assess clarity in presenting the research background, motivation, and objectives.

Marking Criteria:

- 5 marks: Clear background, strong motivation, well-defined objectives.
- 3–4 marks: Background present but objectives partially clear.
- 1–2 marks: Weak explanation or vague objectives.
- 0 marks: Incomplete or copied content.

Why 5 Marks?
The introduction establishes research direction and academic maturity. It reflects students' understanding of the domain.

2. Problem Statement Clarity (3 Marks)

Purpose:
To evaluate whether students define a precise, researchable problem.

Marking Criteria:

- 3 marks: Specific, measurable, and technically valid problem.
- 2 marks: Problem stated but somewhat broad.
- 1 mark: Generic or unclear.
- 0 marks: No defined problem.

Why 3 Marks?
The problem statement is focused but limited in length; therefore, moderate weight is assigned.

3. Literature Review Depth (8 Marks)

Purpose:
To evaluate critical analysis of previous research.

Marking Criteria:

- 8 marks: 12-14 recent papers, critical comparison, synthesis of findings.
- 5–7 marks: Papers summarized but limited comparison.
- 3–4 marks: Mostly descriptive summaries.
- 0–2 marks: Poor referencing or copied work.

Why 8 Marks?
Literature review demonstrates research capability and understanding of existing AI models. It is a major academic component.

4. Research Gap Identification (4 Marks)

Purpose:
To assess analytical thinking and ability to identify limitations in prior work.

Marking Criteria:

- 4 marks: Clearly articulated research gap derived from literature.
- 2–3 marks: Gap mentioned but weak justification.
- 1 mark: Vague claim.
- 0 marks: No research gap identified.

Why 4 Marks?
Identifying a research gap is critical for originality and contribution.

5. Methodology Design (6 Marks)

Purpose:
To evaluate technical planning and feasibility.

Marking Criteria:

- 6 marks: Logical model selection, justified algorithms, clear workflow.
- 4–5 marks: Method described but lacks justification.
- 2–3 marks: Incomplete design.
- 0–1 mark: No technical clarity.

Why 6 Marks?
Methodology determines project success and reflects technical AI understanding.

6. Flowchart / System Architecture (2 Marks)

Purpose:
To assess visual clarity of system design.

Marking Criteria:

- 2 marks: Clear, labeled diagram.
- 1 mark: Present but unclear.
- 0 marks: Missing.

Why 2 Marks?
Important but supportive element.

7. Formatting & Referencing (2 Marks)

Purpose:
To ensure academic writing standards.

Marking Criteria:

- 2 marks: Proper citation style (APA/IEEE), consistent formatting.
- 1 mark: Minor errors.
- 0 marks: Poor formatting or plagiarism risk.

Why 2 Marks?
Encourages academic discipline.

Total: 30 Marks

III. FINAL EXAMINATION (50 MARKS)

Submission Requirements:

- Complete research paper
- Journal formatting compliance
- Plagiarism report
- Proof of journal submission

Detailed Rubric – 50 Marks

1. Implementation & Technical Work (10 Marks)

Purpose:
To assess actual development of AI models.

Marking Criteria:

- 10 marks: Fully implemented, optimized, reproducible results.
- 7–9 marks: Functional but minor limitations.
- 4–6 marks: Basic implementation.
- 0–3 marks: Weak or incomplete.

Why 10 Marks?
Core technical competency is central to AI coursework.

2. Dataset Handling & Preprocessing (5 Marks)

Purpose:
To evaluate data cleaning, feature engineering, and preparation.

Marking Criteria:

- 5 marks: Proper preprocessing with justification.
- 3–4 marks: Basic preprocessing.
- 1–2 marks: Limited explanation.
- 0 marks: No preprocessing.

Why 5 Marks?
Data quality directly impacts AI performance.

3. Experimental Design (5 Marks)

Purpose:
To evaluate validation techniques and evaluation metrics.

Marking Criteria:

- 5 marks: Proper train-test split, cross-validation, relevant metrics.
- 3–4 marks: Basic validation.
- 1–2 marks: Poor evaluation design.
- 0 marks: No evaluation clarity.

4. Results & Performance Analysis (8 Marks)

Purpose:
To assess interpretation of model performance.

Marking Criteria:

- 8 marks: Clear tables, graphs, comparisons, confusion matrix.
- 5–7 marks: Adequate results but limited comparison.
- 2–4 marks: Minimal analysis.
- 0–1 mark: Poor presentation.

Why 8 Marks?
Analysis shows depth of understanding beyond implementation.

5. Discussion & Critical Analysis (5 Marks)

Purpose:
To evaluate reasoning and reflection.

- 5 marks: Insightful interpretation, limitations identified.
- 3–4 marks: Basic discussion.
- 1–2 marks: Superficial.
- 0 marks: Missing.

6. Novelty / Contribution (5 Marks)

Purpose:
To assess originality.

- 5 marks: Clear improvement or innovative approach.
- 3–4 marks: Minor modification of existing model.
- 1–2 marks: Basic replication.
- 0 marks: No contribution.

7. Journal Formatting Compliance (4 Marks)

Purpose:
To ensure professional submission standard.

- 4 marks: Fully aligned with journal template.
- 2–3 marks: Minor formatting issues.
- 0–1 mark: Major errors.

8. Plagiarism Report (3 Marks)

Purpose:
To enforce academic integrity.

- 3 marks: Similarity ≤15%
- 2 marks: 16–20%
- 1 mark: 21–25%
- 0 marks: >25%

9. Proof of Journal Submission (5 Marks)

Purpose:
To ensure real-world research exposure.

- 5 marks: Official confirmation email/screenshot.
- 3–4 marks: Submission proof incomplete.
- 0 marks: Not submitted.

Total: 50 Marks

IV. Educational Rationale

This evaluation structure ensures that students develop:

- Research writing skills
- Critical thinking ability
- AI model implementation competence
- Academic integrity awareness
- Exposure to real journal submission process

It balances:

- Conceptual knowledge (mid exam)
- Technical and practical expertise (final exam)