

**Subject Code: 01AL0801**

**Subject Name: Major Project-1**

**BS. AI & ML, BS AI & DS Year – 4 Semester - 8**

**Objective:** To enable students to undertake a comprehensive AI/ML/DS project involving problem solving, research, design, implementation, testing, deployment, and evaluation of innovative solutions for industrial, societal, or research challenges. The course aims to strengthen technical competence, analytical thinking, teamwork, professional ethics, leadership, and communication skills through project execution and validation.

**Credits Earned:** 15 Credits

**Course Outcomes:** After completion of this course, student will be able to:

- Analyze and solve complex industrial, societal, or research problems using AI/ML/DS techniques. (Analyze)
- Design, implement, and deploy end-to-end intelligent systems using appropriate tools, frameworks, and methodologies. (Apply)
- Evaluate system performance using suitable metrics, validation techniques, and comparative studies. (Evaluate)
- Demonstrate teamwork, project management, leadership, and professional ethics during project execution. (Apply)
- Communicate project outcomes effectively through technical reports, research papers, presentations, demonstrations, and documentation. (Create)
- Develop innovative solutions with potential for publication, patent, entrepreneurship, or industrial adoption. (Create)

**Pre-requisite of course:** Basic Programming

### Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	IA	CSE	Viva(V)	Term work(TW)	
0	0	30	15	0	0	0	50	50	100

**Contents:**



Unit	Topics	Contact Hours
1	Project Planning, Requirement Refinement, Milestone Definition	20
2	Advanced Model Development, System Integration and Optimization	80
3	Validation, Testing, Performance Evaluation and Comparative Analysis	50
4	Deployment, User Testing and Feedback Analysis	60
5	Documentation, Research Paper Preparation and Project Report Writing	40
6	Final Demonstration, Presentation and Viva Voce	50
	<b>Total Hours</b>	<b>300</b>

### Suggested Bloom's Taxonomy Distribution

Distribution of course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
0%	0%	30%	25%	20%	25%

### Suggested List of Activities/Experiments

1. Completion of full-scale project implementation.
2. Model optimization and performance enhancement.
3. Integration of software/hardware components.
4. Testing using standard evaluation metrics.
5. Deployment on cloud, web, mobile, or edge platforms.
6. User acceptance testing and feedback analysis.
7. Preparation of technical paper/manuscript.
8. Preparation of project report and user manual.
9. Final project demonstration.

### Reference Resources

1. Hands-On Machine Learning with Scikit-Learn, Keras & TensorFlow – Aurélien Géron.
2. Deep Learning – Ian Goodfellow, Yoshua Bengio, Aaron Courville.
3. Designing Machine Learning Systems – Chip Huyen.
4. Natural Language Processing with Transformers – Lewis Tunstall et al.
5. Recent IEEE, ACM, Springer, Elsevier, and Scopus-indexed research papers relevant to the project domain.

### **Recommended Evaluation**

The evaluation of Major Project-II shall be based on the successful completion of the project and the student's ability to develop a complete, reliable, and innovative AI/ML/DS solution. Assessment shall consider project planning, implementation quality, technical depth, system integration, testing and validation, deployment, documentation, research contribution, teamwork, professional conduct, presentation skills, and viva performance. Students are expected to demonstrate the practical applicability and effectiveness of their solution through measurable outcomes and comprehensive technical documentation.