

**Project Title: - Multi-Agent System for Adaptive Production Scheduling:** Develop a multi-agent system where individual agents represent different machines and production lines. They use generative AI to dynamically adjust production schedules in response to unforeseen events and RAG to access real-time factory data

# MAJOR PROJECT LOGBOOK

## GROUP MEMBERS

Vaishnavi Poti - 78

Shweta Sidhwani - 103

Ashmit Srivastava – 108

Dhruv Tater – 113

Supervisor/Guide

Dr. G. T. Thampi

Co-Guide

Naveen Vaswani



Department of Artificial Intelligence & Data Science

**Thadomal Shahani Engineering College, Mumbai - 400050**

**University of Mumbai**

(Academic Year 2025-26)



# **INSTITUTE VISION & MISSION**

## **VISION:**

Perpetuating and transcending the processes of:

- Contributing to evolving supply chain of human capital for National Economy
- Creating entrepreneurs and ‘game changers’ to support heightened level of economic activities underpinning ever increasing human aspiration
- Helping the Nation evolve as a total solution provider
- Value and wealth creation for the mankind

## **MISSION:**

Focusing and practicing:

- Product and processes innovation
- Leveraging human cognitive and behavioral science for creating instructional content
- Pervasive and ubiquitous Information Communication Technologies for customized content for learning
- Acknowledge and facilitate various learning styles and learning abilities
- Migrating from teaching paradigm to learning paradigm
- Every day discourse shall inculcate research culture and further the cause of societal advancement
- Understand various markets and cultures
- Collaborative learning and emotional integrity
- Sensitizing about opportunities in Energy, Education, Environment and Health care sectors
- Extensively promoting computer aided design, analysis and manufacturing procedures
- Theoretical rigor to develop conceptual clarity
- Modeling and design of experiments to inculcate culture of investigation
- Helping foot print on Project management and collaborative human endeavor
- Interdisciplinary studies and exposure to functional areas

# ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

## **VISION:**

Transcending the process of integrating intelligence to Technology Products and Processes by architectural and algorithmic solution building procedures resulting in autonomous entities which shall surpass collective human intelligence.

## **MISSION:**

- Engage learners to develop competency in algorithmic approaches in resolving complexities of real time problems.
- Help pupils to develop competency in creative and architectural solution building processes for building efficiencies
- Initiate the learners to intuitive / imaginative solution building processes as a complimentary skill set
- Scaling up the process of creating digital learning content in the realm of AI & DS underpinning the theories of cognitive science and virtual / augmented reality techniques
- Design and create a supply chain of human capital with high degree of intellectual/ emotional and spiritual quotient to man the evolving National economies.
- Equip students with multi-disciplinary skill sets to offer solutions to real time problems through initiating them to the process of research and innovation
- To create an academic environment for higher learning, lifelong learning, academic excellence, and research endeavours.
- Design ways and means of initiating learners to acquire high level of mathematical integrity and analytical competency.
- Training the learners to develop emotional integrity, interpersonal Intelligence, and intrapersonal intelligence to make them evolve as a Human capital for the society at large.
- Sensitising learners about sustainable development process, resilience of systems, and desirability of influencing the evolving world order to optimise wealth and value creation for the mankind.

## **PROGRAM EDUCATIONAL OBJECTIVES (PEO's)**

### **PEO I:**

Graduate shall develop actionable competency in the realm of Artificial Intelligence & Machine Learning, Data Analytics, and Blockchain

### **PEO II:**

Graduates shall be inducted in the supply chain of human capital to transcend current level of research in AI and Data Science.

### **PEO III:**

Graduates shall be industry ready to man the ever increasing and accelerated demand of Information Technology behemoths in the national and global space to build intelligence solutions in the technology marketplace.

### **PEO IV:**

Graduates will exhibit professional ethics and moral value with the capability of working as an individual and as a team to contribute to further the cause of industry and society at large.

## PROGRAM OUTCOMES (POs)

Engineering Graduates will be able to:

PO's	OUTCOMES
PO1	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	<b>Design/development of solutions:</b> Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	<b>Conduct investigations of complex problems:</b> Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	<b>Modern tool usage:</b> Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO6	<b>The engineer and society:</b> Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	<b>Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

<b>PO9</b>	<b>Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
<b>PO10</b>	<b>Communication:</b> Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
<b>PO11</b>	<b>Project management and finance:</b> Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
<b>PO12</b>	<b>Life-long learning:</b> Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

## **PROGRAM SPECIFIC OUTCOMES (PSOs)**

**PSO1:** The ability to conceptualise, formulate, design, analyse and create solutions underpinning the knowledge of human cognition, Digital-Computational technologies, Artificial Intelligence and Data Science in terms of real-world problems to contribute to sustainable progress of mankind at large.

**PSO2:** The ability to apply knowledge of basic science, probability & statistics, computational algorithms to carryout research to contribute the body of knowledge in the realm of computer science/engineering and Artificial Intelligence & Data Science.

## STUDENT's INFORMATION

**Project Title:** Multi-Agent System for Adaptive Production Scheduling: Develop a multi-agent system where individual agents represent different machines and production lines. They use generative AI to dynamically adjust production schedules in response to unforeseen events and RAG to access real-time factory data.

	Student 1	Student 2	Student 3	Student 4
Student ID	2201078	2201103	2201108	2201113
Name	Vaishnavi Poti	Shweta Sidhwani	Ashmit Srivastava	Dhruv Tater
Class with Division	B2	B2	B2	B2
Contact No.	86576 67236	99203 51626	81693 49915	8779471231
E-mail	potivaishnavi21@gmail.com	shweta1.sidhwani@gmail.com	ashmitsrivastava1607@gmail.com	taterdhruv0310@gmail.com
Address	F-90, Shrinagar C.H.S, P.L Lokhande Marg, Chembur(W), Mumbai, 400089	A-1206, Rustomjee Azziano, Majiwada, Thane(W), Mumbai-400601	53A Jaldarshan society, Block 2A ,Nepeansea Road, Mumbai-400026	1401, Shiv Tapi , Road H.G.Road , Gamdevi, Mumbai-400007



## **INSTRUCTIONS TO STUDENTS**

- The logbook must be submitted to the Guide or Co-Guide for verification and evaluation of project activities at least once in a week.
- Log book duly signed by guide must be submitted with project report for evaluation at the end of semester to the department.

## **DECLARATION**

I/We declare that this project represents my ideas in my own words without plagiarism and wherever others' ideas or words have been included. I have adequately cited and referenced the original sources. I/We also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my project work. I/We promise to maintain minimum 75% attendance, as per the University of Mumbai norms. I/We understand that any violation of the above will be cause for disciplinary action by the Institute.

Yours Faithfully

1. Vaishnavi Poti

2. Shweta Sidhwani

3. Ashmit Srivastava

4. Dhruv Tater

**(Date & Signature of Students)**

## LETTER OF ACCEPTANCE

I undersigned, Dr. G. T. Thampi working in Artificial Intelligence and Data Science Department, is willing to guide the project titled “Multi-Agent System for Adaptive Production Scheduling: Develop a multi-agent system where individual agents represent different machines and production lines. They use generative AI to dynamically adjust production schedules in response to unforeseen events and RAG to access real-time factory data.” for the Major Project-1 Semester VII respectively for the Academic Year 2025-26.

The names of the students are:

1. Vaishnavi Poti
2. Shweta Sidhwani
3. Ashmit Srivastava
4. Dhruv Tater

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**(Project Guide)**

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**(Major – Project Coordinator)**

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**(HoD – AI & DS)**

## COURSE OUTCOMES

CO No.	Course Outcome	POs Covered	PSOs Covered
<b>CO1</b>	Identify problems based on societal /research needs.	PO2, PO6, PO7,PO12	PSO2
<b>CO2</b>	Apply Knowledge and skill to solve societal problems in a group.	PO1, PO3, PO6, PO7, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2
<b>CO3</b>	Draw the proper inferences from available results through theoretical/ experimental/simulations.	PO2, PO4, PO5, PO9, PO10, PO11, PO12	PSO1, PSO2
<b>CO4</b>	Analyze the impact of solutions in societal and environmental context for sustainable development.	PO2, PO3, PO6, PO7, PO9, PO10, PO11, PO12	PSO1, PSO2
<b>CO5</b>	Demonstrate capabilities of self-learning in a group, which leads to lifelong learning.	PO6, PO9,PO10, PO12	PSO1, PSO2
<b>CO6</b>	Demonstrate project management principles during project work.	PO9, PO10,PO11	PSO1, PSO2

## CO – PO – PSO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	--	2	--	--	--	2	2	--	--	--	--	2	--	2
CO2	2	--	2	--	--	2	2	2	2	2	2	2	2	2
CO3	--	3	--	3	3	--	--	--	2	3	3	3	2	3
CO4	--	3	3	--	--	3	2	--	2	3	3	3	2	3
CO5	--	--	--	--	--	2	--	--	2	2	--	2	2	3
CO6	--	--	--	--	--	--	--	--	3	3	3	--	2	3

## SCHEDULE FOR MAJOR PROJECT

Date	Week	Contents	Remark	Guide Sign
14-07-2025	1	Introduction to Major-Project		
16-07-2025	2	Selection of the Topic		
26-07-2025	3	Gained Knowledge of the fundamentals of Multi-agent Systems		
03-08-2025	4	Requirement gathering and design of project structure.		
13-08-2025	5	Review – 1		
22-08-2025	6	Implementation of system using CrewAI		
30-08-2025	7	Implementation of system using Langchain		
07-09-2025	8	Integration of methodologies		
22-09-2025	9	Review - 2		
29-09-2025	10	Testing and Validation of the System		
6-10-2025	11	Integration with Real-Time Factory Data via RAG		
13-10-2025	12	Documentation and Report Preparation		
29-10-2025	13	Final Review		

## PROGRESS / ATTENDANCE REPORT

Multi-Agent System for Adaptive Production Scheduling: Develop a multi-agent system where individual agents represent different machines and production lines. They use generative AI to dynamically adjust production schedules in response to unforeseen events and RAG to access real-time factory data.

Group No. 24	Name of Student 1: Vaishnavi Poti
	Name of Student 2: Shweta Sidhwani
	Name of Student 3: Ashmit Srivastava
	Name of Student 4: Dhruv Tater
Name of the Supervisor/Guide: <b>Dr. G. T. Thampi</b>	

Sr. No	Date	Attendance				Progress/Suggestion	Mapping		
		1	2	3	4		CO	PO	PSO
1	14-07-2025	✓	✓	✓	✓	Introduction to Major-Project			
2	16-07-2025	✓	✓	✓	✓	Selection of the Topic			
3	26-07-2025	✓	✓	✓	✓	Gained Knowledge of the fundamentals of Multi-agent Systems			
4	03-08-2025	✓	✓	✓	✓	Requirement gathering and design of project structure.			
5	13-08-2025	✓	✓	✓	✓	Review – 1			
6	22-08-2025	✓	✓	✓	✓	Implementation of system using CrewAI			
7	30-08-2025	✓	✓	✓	✓	Implementation of system using Langchain			



8	07-09-2025	✓	✓	✓	✓	Integration of methodologies			
9	22-09-2025	✓	✓	✓	✓	Review - 2			
10	29-09-2025	✓	✓	✓	✓	Testing and Validation of the System			
11	6-10-2025	✓	✓	✓	✓	Integration with Real-Time Factory Data via RAG			
12	13-10-2025	✓	✓	✓	✓	Documentation and Report Preparation			
13	29-10-2025	✓	✓	✓	✓	Final Review			

**Name, Date & Sign of Supervisor / Guide**

## REVIEW – 1 FORM

**Group No:** 24

**Title of Major – Project:** Multi-Agent System for Adaptive Production Scheduling: Develop a multi-agent system where individual agents represent different machines and production lines. They use generative AI to dynamically adjust production schedules in response to unforeseen events and RAG to access real-time factory data

**Date of Review:** 13-08-2025

**No. of students in project team:** 04

**Student Major-Project Performance Analysis** (Put Tick as per your observation)

Excellent (3)		Very Good (2)		Good (1)	
Sr. No.	Observation	(3)	(2)	(1)	
1	Quality of problem and clarity				
2	Literature Survey				
3	Innovativeness in solutions				
4	Feasibility of the project				
5	Usage of technology				
6	Cost effectiveness and Societal impact				
7	Overall Presentation and Performance				
<b>Comments:</b>					

**Project Guide & Panel Members Signature:**

1) Dr. G. T. Thampi

2) Dr. Madhuri Rao

3)

**Name, Date & Signature**  
**(Project Coordinator)**

**Name, Date & Signature**  
**(HoD – AI & DS)**

## REVIEW – 2 FORM

**Group No:** 24

**Title of Major – Project:** Multi-Agent System for Adaptive Production Scheduling: Develop a multi-agent system where individual agents represent different machines and production lines. They use generative AI to dynamically adjust production schedules in response to unforeseen events and RAG to access real-time factory data

**Date of Review:** 22-09-2025

**No. of students in project team:** 04

**Student Major-Project Performance Analysis** (Put Tick as per your observation)

Excellent (3)		Very Good (2)		Good (1)	
Sr. No.	Observation	(3)	(2)	(1)	
1	Usage of effective skill sets				
2	Design and Implementation				
3	Testing and Analysis				
4	Use of standard engineering norms				
5	Cost-effectiveness and Societal Impact				
6	Contribution of an individual member of the team				
7	Overall Presentation & Performance				
Comments:					

**Project Guide & Panel Members Signature:**

1) Dr. G. T. Thampi

2) Dr. Madhuri Rao

3)

**Name, Date & Signature**  
**(Project Coordinator)**

**Name, Date & Signature**  
**(HoD – AI & DS)**

## EXAMINER'S FEEDBACK FORM

Name of External Examiner: \_\_\_\_\_

College of External Examiner: \_\_\_\_\_

Name of Internal Examiner: \_\_\_\_\_

Date of Examination: \_\_\_\_\_

No. of students in project team: 04

Availability of separate lab for the project: Yes

Student Major-Project Performance Analysis (Put Tick as per your observation)

Excellent (3)		Very Good (2)		Good (1)	
Sr. No.	Observation	(3)	(2)	(1)	
1	Quality of problem and clarity				
2	Innovativeness in solution				
3	Cost effectiveness and Societal impact				
4	Full functioning of working model as per stated requirements				
5	Effective use of skill sets				
6	Effective use of standard engineering norms				
7	Contribution of an individual as member or leader				
8	Clarity in written and oral communication				
9	Overall performance				

- Can same major project extend to next semester by adding new objectives/ideas? (Yes/No)
- If yes, suggest new Innovative Technique / Idea / Objectives related to this project.

Name, Date & Signature  
(External Examiner)

Name, Date & Signature  
(Internal Examiner)

Name, Date & Signature  
(HOD -AI&DS)