MIT-PE Applied Data Science Program (ADSP)

Capstone Project Briefing Session
Sep '23 cohort

Capstone Project Objectives

- Experience end-to-end problem-solving using a combination of tools and techniques in machine learning

- Learn practical implementation of various analytical techniques and choose the one which gives results most appropriate for business

- To understand the trade-offs that need to be made when solving a problem in real life

- To develop better presentation and report writing skills

Capstone Project Objectives

Course	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
MIT-PE Applied Data Science Program Sep'23							
Revision Week 2	**Nov-20**	**Nov-21**	**Nov-22**	**Nov-23**	**Nov-24**	**Nov-25**	**Nov-26**
	Optional Conceptual Revision Session	Optional Case Study Revision session	Office Hours Code Debugging Session - 2		Elective Project Submission deadline	1. Capstone Briefing Session 2. Capstone Milestone Submission opens	

Capstone Project Objectives

Course	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
MIT-PE Applied Data Science Program Sep'23							
Capstone Week 1	Nov-27	Nov-28	Nov-29	Nov-30	Dec-1	Dec-2	Dec-3
							Milestone Q&A Session
Capstone Week 2	Dec-4	Dec-5	Dec-6	Dec-7	Dec-8	Dec-9	Dec-10
	Capstone Milestone Submission Deadline	Capstone Final Submission opens					Capstone Q&A Session
Capstone Week 3	Dec-11	Dec-12	Dec-13	Dec-14	Dec-15	Dec-16	Dec-17
				1. Capstone Final Submission deadline 2. Capstone Live presentation slides submission deadline		Live Presentations	Live Presentations

Capstone Project Objectives

Phases	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
MIT-PE Applied Data Science Program Sep'23							
Break	Dec-18	Dec-19	Dec-20	Dec-21	Dec-22	Dec-23	Dec-24
	Winter Break						
	Dec-25	Dec-26	Dec-27	Dec-28	Dec-29	Dec-30	Dec-31
	Winter Break						
Optional Great Learning Events	Jan-1	Jan-2	Jan-3	Jan-4	Jan-5	Jan-6	Jan-7
				Hackathon Registration Opens			
	Jan-8	Jan-9	Jan-10	Jan-11	Jan-12	Jan-13	Jan-14
				Hackathon Registrations Closed	Hackathon Submissions Open		
	Jan-15	Jan-16	Jan-17	Jan-18	Jan-19	Jan-20	Jan-21
				Hackathon Submissions Closed		Program Completion Ceremony	
	Jan-22	Jan-23	Jan-24	Jan-25	Jan-26	Jan-27	Jan-28
			Capstone Project Final Submission & Live Presentations' Scores Release				

Capstone Projects

01

UNSUPERVISED LEARNING

(Data Analysis & Visualization)

02

REGRESSION

(Machine Learning)

03

CLASSIFICATION

(Practical Data Science)

04

DEEP LEARNING
Malaria Detection & Facial Emotion Detection

(Deep Learning)

05

RECOMMENDATION SYSTEM

(Recommendation Systems)

Capstone Projects

Great Learning
POWER AHEAD

Stages

01 **PROJECT OVERVIEW AND SELECTION**

02 **PROJECT RELEASE**

03 **MILESTONE**

04 **FINAL SUBMISSION & LIVE PRESENTATION**

LOW CODE Vs FULL CODE

Submission Type	Who should choose?	What is the same across the two?	What is different across the two?	Final submission file [IMP]	Submission format
Full-Code	Learners who aspire to be in hands-on coding roles in the future focused on building solution codes from scratch	Perform exploratory data analysis to identify insights & recommendations for the problem	Focus on code writing: 10-20% grading on the quality of the final code submitted	Solution notebook from the full-code template submitted in .html format	.html
Low-Code	Learners who aspire to be in managerial roles in the future focused on solution review, interpretation, recommendations & communicating with business		Focus on business report: 10-20% grading on the quality of the final business report submitted	Business report in .pdf format with problem definition, insights, and recommendations	.pdf

Submission

Full Code Version:

The full code way is to write the solution code from scratch and only submit a final Jupyter notebook in .html format with all the insights and observations.

Please follow the below steps to complete the submission:

- Download the full-code version of the learner notebook
- Follow the instructions provided in the notebook to complete the project
- Clearly write down insights and recommendations for the business problems in the comments
- Submit only the solution notebook prepared from the learner notebook [format - HTML]

Submission

Low Code Version:

The low-code way is to use an existing solution notebook template to build the solution and then submit a Business Report in .pdf format with insights and recommendations.

Please follow the below steps to complete the submission:

- Download the low-code version of the learner notebook
- Follow the instructions provided in the notebook to complete the project
- Prepare a Business Report with insights and recommendations to the business problem
- Submit only the presentation [format: PDF]

Kindly note that if you submit the notebook along with the report, ONLY the report will be evaluated

Milestone

1. Problem Definition
The context - Why is this problem important to solve?
The objectives - What is the intended goal?
The key questions - What are the key questions that need to be answered?
The problem formulation - What is it that we are trying to solve using data science?

2. Data Exploration
Data Description - What is the background of this data? What does it contain?
Observations & Insights - What are some key patterns in the data? What does it mean for the problem formulation? What are the data treatments or pre-processing performed?

3. Building various models - This involves constructing multiple relevant models to solve the problem and evaluating their performance. The models can be fine-tuned to determine whether their performance can be improved.

4. Comparison of various techniques and their relative performance - How do different techniques perform? Which one is performing relatively better? Is there scope to improve the performance further?

5. Proposal for the final solution design - What model do you propose to be adopted? Why is this the best solution to adopt?

Milestone Scoring

Criteria	Points
Problem Definition	4 points
Data Exploration	4 points
Building Models	4 points
Comparison of various techniques and their relative performance based on chosen Metric (Measure of success)	4 points
Proposal for the final solution design	4 points
Total Points	**20 points**

Final Submission

The Final Submission should focus on the key takeaways from the project. This is the final proposal to solve the problem that a business leader or a decision-maker should consume.

This Final Submission should have three key parts:

1. **Executive Summary** -

- What are the most important findings from the analysis done in Milestone?
- Describe the final proposed model specifications

2. **Problem and solution summary** -

- Provide the summary of the problem
- State the reasons for the proposed solution design
- How it would affect the problem/business?

3. Recommendations for implementation -

- What are some key recommendations to implement the solution?
- What are the key actionables for stakeholders?
- What is the expected benefit and/or costs (List the benefits of the solution. State some rational assumptions to put forward some numbers on costs/benefits for stakeholders)?
- What are the potential risks or challenges of the proposed solution design?
- What further analysis needs to be done or what other associated problems need to be solved?

Final Submission Scoring

Criteria	Points
Executive Summary	15 points
Problem and Solution Summary	10 points
Recommendations for Implementation	15 points
Total Points	**40 points**

Live Presentation

- This is the final stage of the Capstone journey, where you are supposed to present your solution to a panelist for 8-9 minutes and then answer the questions in the next 4-5 minutes.
- The objective should be to draw your audience's attention to the key points of your project - problem definition, solution design, key findings/insights, and business recommendations.
- **Structure the presentation well**. It is good to start with key takeaways - overview of the problem, approach for the solution, key findings & insights, and recommendations & next steps. The inclusion of the potential benefits of implementing the solution will give you the edge
- **You will be given 8-9 minutes to present** and there will be a hard stop after 9 minutes, so practice well to present within the time limit
- **This will be followed by 4-5 minutes of question & answer**. Questions can be from a business or academic perspective (sometimes there might be a Subject Matter Expert sitting in the room, who will ask academic or conceptual questions pertaining to your submission). 1-2 minutes shall be allotted as buffer time.
- **Focus on explaining the takeaways** in an easy-to-understand manner (a business leader wouldn't know about the term 'confusion matrix' but might understand '% of events (1s) predicted correctly by the model)
- The final presentation **should be submitted before the session**.
- The date & time of the presentation will not change once finalized

Live Presentation Scoring

Criteria	Points
Quality of Slides - Structure, flow and neatness	10 points
Understanding of the Solution - Ability to explain concepts	15 points
Depth of Analysis - Methodology & Rigour	15 points
Total Points	**40 points**

Support System

Role of a Mentor

- **What to Expect: A mentor is a guide who will enable you to achieve your project outcomes.**
    - Consultant: Share his/her own industry experience and provide direction with his/her expertise.
    - Guru/Mentor: Provide knowledge, hacks, insights, guidance, identify resources to learn, and stay updated.
    - Leader: Motivate and build confidence, offer encouragement, and help you move out of your comfort zone.
- **What NOT to Expect: The mentor will not provide feedback or solutions to the project questions**

Other Support Channels:

- **Slack Channel**: We will create new group channels on Slack on the basis of your project selection. You could engage in discussions with your peers via these channels
- **FAQ Document**: We request that you kindly check the FAQ document for your project for any queries/questions.
- **Support Tickets**: Our academic team shall guide you as in when you need them, too. You could raise support requests through the 'Need Assistance' option in Olympus to seek their assistance for the queries unresolved through FAQ documents

Please reach out to your Program Manager in case you require any further assistance

Any Questions?