

# Fuse AI Fellowship 2025

## Logistics

### Lectures:

- Lectures will be conducted online using Google Meet. The link for each session will be shared on the platform as well as on a shared calendar.
- The session will be 2 hours long, usually with a short 5-10 mins breaks.
- All learners (more than 200 participants) will join the same lecture session. To maintain focus, please ask questions that are directly relevant to the topic being discussed. But don't hesitate to ask the facilitator to pause, slow down or ask to repeat certain topics immediately when the topic is presented.
- **Very Important:** Before joining the sessions, learners should complete the assigned pre-task, as lectures will build upon this foundational knowledge. These pre-task might take 2-5 hrs based on your existing knowledge, so prepare in advance.
- There will be tasks provided after each session to allow learners to practice applying the concepts covered.
- Lectures will be recorded and uploaded to the Fuse Classroom platform after each session for future reference and review.
- While attendance does not directly factor into your final score, it is still mandatory. We have noticed that consistent attendance despite the busyness of life, will help you stay motivated and engaged throughout the program.

## Course Contents

This program is designed as a high-intensity bootcamp to teach a large number of topics in Artificial intelligence as quickly and efficiently as possible. We'll be using content created at Fusemachines as well as various contents available online. Learners are expected to go through as much content and code as possible to gain in-depth knowledge of the topics.

The course content is designed in a sequential manner, where each topic builds upon the foundations laid in previous ones. Skipping topics in the early weeks can lead to difficulties in understanding subsequent modules and make it increasingly challenging to catch up as the course progresses. It is strongly recommended to follow the course sequence and cover the content in specified

time and avoid skipping topics unless you are already proficient in them. If you are familiar with certain topics, feel free to advance to new ones at your own pace.

## **TA Sessions**

The primary goal of TA sessions is to provide you with guided support and clarification as you go through your projects. TAs will help you to clarify your project requirements, troubleshoot some technical issues, and answer any questions you may have. Additionally, TA sessions may also aim to reinforce key concepts covered in lectures or readings, and provide opportunities for you to practice applying those concepts in a hands-on setting. Ultimately, the goal of TA sessions is to help you succeed in your coursework by providing you with the support you need to complete your projects effectively.

TA sessions will start after 4 Modules. By when you should have selected a project that you'd like to work on through the program.

TAs will provide you with the Google Meet link for the weekly sync up meeting. However feel free to catch up with them in the discord channel. This is usually a one hour session.

TAs will also host onsite meetups for the group to meet and discuss their project together and work together at fusemachines.

## **Quiz and Assignments**

- MCQ and Subjective Questions are provided in each chapter or module to help you reinforce the topics.
- Paper Review: In later modules, you'll be asked to write a 1 page paper review on a recent AI paper of your choice. Consider papers from NeurIPS, CVPR, etc.
- Coding Assignment: There are coding assignments in most of the modules to help develop your AI/ML coding abilities. Coding assignments are automatically graded with a code grader which follows a certain format. Please make sure to adhere to the format provided.
- Exam: There will also be one or more proctored exam in the course to test your abilities. This could be MCQ, Subjective, Programming questions as well as interview type exams.

## Office Hours

Office hours are hosted every week, if you have any questions related to that particular week's content, please join the session and clarify your doubts. This may also include some more deeper dives. This is a one hour long session.

The links to the office hour will also be available on the platform as well as on the shared calendar.

## Project

Group Formation: Group of 1-5 people. More people help you to learn team collaboration

The project will be pushed on the AI fellowship Github Repo. We'll be asking you to submit your github ID to add you to the repo. You'll be able to check out others' code based on ask.

The list of potential projects will be provided to you, you may even brainstorm and select your own project In which case you'll have to submit a proposal.

For New projects: It need not be a new deep learning method, but can utilize current state of the art AI models to solve a particular problem. You'd need to research if the problem has been solved previously. Which deep learning model suits the problem. Identify the dataset and acquire the data (public data or generate your own) and train the model. You can also choose to build an Agentic System, in that case, you'd need to make it robust by considering all the scenarios. Whatever you choose, remember that this project would be a part of your portfolio and will definitely impact your career later. So make sure to choose a difficult problem that needs considerable time and effort.

## Milestones:

- Literature Review / Product Market Research: Requirement Analysis
- Multiple Review/Checkpoints
- Project Submission
- 3 Minute Presentation : pitching and demo within 3 minutes is a challenge that you'd need to overcome

## Resource for Project

- **GPU:** You'll be mostly using your own resources, publicly available resources in GoogleColab, Kaggle, Paperspace Gradient, Codesphere, or other sites. Based on need we may also provide access to GoogleColab Pro, RunPod GPU or Lambda Labs GPU. GPUs are costly so use them cautiously.
- **APIs:** We also provide access to API keys for a few LLM providers such as OpenAI, Claude. However, we will make use of a free APIs from other platforms such as HuggingFace, AI Studio, as well
- **Cloud Resources:** In case of production ready application, we may provide access to AWS or GCP cloud resources with limited funds to deploy your application to production.

## Grading

The evaluation will be a mix of online and onsite evaluations with the following weights

SN	Mode of Assessment	Particulars	Frequency	Weight	Total
1	Online	Quiz/Paper Assignments	End of chapter	15%	55 %
		Code Assignments	End of Unit	40%	
2	Onsite (Instructor Graded)	Proctored Exam	At end of the course course	10%	45 %
		Onsite Assignment (project)	Decided by instructors	30%	
		Class Participation	Decided by Learning Experience Team	5%	

## Deadline Policy

The assignments and projects are key to graduating through this fellowship program. Hence each project and project milestones have a deadline to keep

students on the pace towards graduation. If you miss the deadline your delayed submission will not be accounted for in the final score. So please, do not wait until the final deadline to submit the assignments and project and start working as early as possible.

## **Plagiarism & Honor code**

Large Language Models (LLMs) can be powerful tools for brainstorming, helping explore diverse perspectives, overcome creative blocks, challenge assumptions, and rapidly code and prototype ideas. However, they are tools to assist, not replace, your critical thinking. It's essential to evaluate ideas critically, refine them, and maintain ownership, using the LLM's output as a starting point to enhance creativity and innovation. Use them but don't rely entirely on them. Use it to learn rather than completing your assignments.

## **Support and request**

You can write to us for any suggestions, leave requests, request for extension for assignment or project through the TAs or write us to [aifellowship@fusemachines.com](mailto:aifellowship@fusemachines.com).

Note: Not all requests for extensions will be granted.

## **AI Fellowship Community**

We have a form in the platform itself, which you can use to ask any queries, interact with other fellows. However, for active communication we use discord. Please join through the invite link shared in the announcement, or request a new one if it doesn't work.

Please use this form for engaging and collaborative discussion with your fellows, so avoid discrimination, harassment or passing inappropriate contents.

## Schedule

Week 1.	Introduction to AI and Pre-requisites Review
Week 2.	Python Ecosystem: Building a Twelve-Factor App
Week 3.	Data Wrangling: Pandas & SQL
Week 4.	Data Visualization & Presentation
Week 5.	Regression
Week 6.	Popular ML Models
Week 7.	Ensemble Models & Hyper Parameter Tuning
Week 8.	Feature Engineering & Other Preprocessing Techniques
Week 9.	Time Series & Forecasting
Week 10.	Image Processing
Week 11.	Clustering
Week 12.	Deep Neural Networks
Week 13.	CNN, Object Detection, Segmentation & Transfer Learning
Week 14.	Representation Learning
Week 15.	Natural Language Processing
Week 16.	Sequence Modelling
Week 17.	Structuring, Experimenting & Benchmarking Models
Week 18.	Generative Adversarial Networks
Week 19.	Language Models & Large Language Models
Week 20.	Foundational Models
Week 21.	Prompt Engineering, RAG & Agentic AI
Week 22.	Prototyping with ML Services & Frameworks
Week 23.	MLOPs
Week 24.	Project Presentation
Week 25.	Project Presentation