

CAREER PROGRAM · SYLLABUS · DATA & AI

# AI Engineering: Generative AI & Agentic AI

Go from neural network fundamentals to building and deploying production AI applications — Transformers, RAG, vector databases, and multi-agent systems, built and shipped.

**DURATION**  
14 Weeks

**COMMITMENT**  
10 hrs/week

**LEVEL**  
Advanced

**FORMATS**  
Online Live · Offline  
(Coimbatore) · Self-  
Paced

## Tools & tech stack

LLMs & Transformers

RAG Pipelines

Vector DBs

LangChain / Multi-Agent Systems

Python

PyTorch

Hugging Face

LangChain

Ollama

CrewAI

Docker

Claude / ChatGPT

## Who it's for

- Developers who already understand machine learning and deep learning fundamentals

## What you'll learn

- Transformer architecture, embeddings, and vector databases
- Retrieval-augmented generation (RAG) and its common variations
- Agentic AI: tools, memory, and multi-agent orchestration patterns
- LLM evaluation, observability, and containerized deployment

## Curriculum

### 01 Part 1: AI Engineering and Software Foundations

- AI Engineering Roles and Lifecycle
- Python Engineering
- APIs Git and Containers

### 02 Part 2: Machine Learning for AI Engineers

- End to End Machine Learning
- Evaluation and Model Selection
- ML Service Integration

### 03 Part 3: Deep Learning Foundations

- Neural Networks and Optimisation
- Framework and Accelerator Workflow
- Modern Neural Architectures

#### 04 Part 4: Natural Language Processing Transformers and LLMs

- NLP and Embeddings
- Transformers and Large Language Models
- Provider and Model Integration

#### 05 Part 5: Prompt Engineering Structured Outputs and Adaptation

- Prompt Design
- Structured Generation and Validation
- Fine Tuning and Model Adaptation

#### 06 Part 6: Retrieval Augmented Generation and Knowledge Systems

- Document Ingestion and Indexing
- Retrieval and Reranking
- RAG Generation and Evaluation
- Advanced Knowledge Architectures

#### 07 Part 7: Agents Tools and Workflow Automation

- Tool Use and Function Calling
- Agent Architecture and State
- Agent Reliability and Evaluation
- Automation and Business Integration

#### 08 Part 8: Multimodal AI

- Vision and Vision Language Models
- Speech Audio and Video
- Multimodal Product Integration

#### 09 Part 9: AI APIs Product Engineering and User Experience

- AI Backend Architecture
- AI Interfaces and Product UX
- Data Privacy and Application Security
- Feedback Analytics and Product Improvement

#### 10 Part 10: Deployment Inference and Cloud Architecture

- Model Serving and Inference
- Cloud and Kubernetes Architecture
- Scaling Reliability and Cost
- CI CD and Infrastructure Automation

#### 11 Part 11: Evaluation LLMOps Monitoring and Responsible AI

- AI Evaluation Engineering
- Experiment Tracking and AI Asset Management
- Observability and Monitoring
- Responsible AI Governance and Red Teaming

#### 12 AI Pro

- Using Claude, ChatGPT, and Perplexity to design and debug prompts and agent behavior
- Verifying AI-generated code, prompts, and agent outputs before trusting them in production
- Project: An end-to-end AI application — from prompt design through RAG or agent logic to a deployed, containerized service

### Projects

- A fine-tuned model adapted to a custom domain using transfer learning
- A retrieval-augmented chatbot answering questions grounded in a real document set
- A multi-agent system where specialized agents collaborate on a research or verification task

- A containerized, deployed AI application with basic evaluation and observability in place

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Self-paced from ₹1,999 · EMI options available · certificate released for a one-time ₹100 fee · batch dates and fees confirmed at enrolment

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