COMPLETE MASTER PROGRAM

AI ENGINEERING

Prompt Engineering, Generative AI & Agentic AI

Build Real-World AI Applications, Autonomous Agents & Production-Ready Solutions

TOOLS & TECHNOLOGIES

Python	SQL	OpenAI	Azure OpenAI
LangChain	LangGraph	Pinecone	FAISS
Chroma	Hugging Face	MLflow	Streamlit

DURATION	GUIDED HOURS	WHO CAN JOIN?
4 Months	240 Hours	Students, Graduates, Working Professionals (Beginner to Advanced)

PROGRAM APPROACH

Build skills progressively through Python, prompt engineering, LLMs, RAG, vector databases, Agentic AI, multi-agent orchestration, GenAI application development, responsible AI, enterprise architecture and a practical capstone.

CAREER LAUNCHPAD

Learn. Practice. Get Hired.
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MODULE 01 | 20 Hours | Weeks 1–2
Python for AI Engineering

MODULE OVERVIEW
Build a strong Python foundation for AI and GenAI applications.

TOPICS COVERED

- Python essentials (syntax, data types, loops)
- Data handling with NumPy & Pandas
- Data preprocessing & EDA
- Working with real datasets
- Visualization with Matplotlib & Seaborn

REAL-WORLD EXAMPLE
Perform EDA on business data and derive insights.

PRACTICE PROJECT
Build an end-to-end EDA & visualization project.

MODULE 02 | 18 Hours | Weeks 3–4
Prompt Engineering

MODULE OVERVIEW
Learn to design effective prompts to get accurate, reliable and business-ready responses from LLMs.

TOPICS COVERED

- Prompt design frameworks
- Zero/Few-shot prompting
- Role, context & instruction prompting
- Chain-of-thought & reasoning prompts
- Prompt evaluation & optimization
- Safety, guardrails & responsible use

REAL-WORLD EXAMPLE
Improve LLM responses for a business use case using prompts.

PRACTICE PROJECT
Build a prompt library & evaluate response quality.

MODULE 03 | 20 Hours | Weeks 5–6
Generative AI & LLM Fundamentals

MODULE OVERVIEW
Understand GenAI, LLMs and how to use them to create text, images and multi-modal applications.

TOPICS COVERED

- LLM architecture (Transformer, GPT, etc.)
- Model APIs (OpenAI, Azure OpenAI, etc.)
- Text, image & multi-modal generation
- Fine-tuning vs. RAG (when to use)
- Model evaluation (quality, hallucination, latency, cost)

REAL-WORLD EXAMPLE
Build a content generator (text, image or summary) using an LLM.

PRACTICE PROJECT
Create a GenAI app (e.g., document summarizer or content creator).

MODULE 04 | 24 Hours | Weeks 7–8
Retrieval-Augmented Generation (RAG)

MODULE OVERVIEW
Build GenAI applications that retrieve relevant information to produce accurate and grounded responses.

TOPICS COVERED

- RAG architecture & components
- Document processing (PDF, Word, Web)
- Chunking, embeddings & vector search
- Vector databases (Pinecone, FAISS, Chroma)
- RAG evaluation & grounding techniques

REAL-WORLD EXAMPLE
Build a Q&A; assistant on your own documents.

PRACTICE PROJECT
Build an end-to-end chatbot with a vector database (FAISS/Pinecone/Chroma).

MODULE 05 | 20 Hours | Weeks 9–10
Agentic AI Fundamentals

MODULE OVERVIEW
Learn the concept, design and development of AI agents that can plan, act and use tools to achieve goals.

TOPICS COVERED

- What is an AI agent & how they work
- Agent components (plan, act, observe)
- Tool use & function calling
- Memory, state & context management
- Designing single & multi-agent systems

REAL-WORLD EXAMPLE
Create an AI agent that can search, analyze and generate a report.

PRACTICE PROJECT
Build a multi-step agent with tool calling (e.g., web search + summarizer).

MODULE 06 | 22 Hours | Weeks 11–12
Multi-Agent Systems & Workflow Orchestration

MODULE OVERVIEW
Design and orchestrate multiple AI agents to solve complex, real-world business tasks.

TOPICS COVERED

- Multi-agent design patterns
- Orchestration with LangGraph
- Collaboration, delegation & handoffs
- State management & persistence
- Real-world use cases & best practices

REAL-WORLD EXAMPLE
Build a multi-agent workflow for research, analysis and reporting.

PRACTICE PROJECT
Create a multi-agent pipeline using LangGraph.

MODULE 07 | 22 Hours | Weeks 13–14
Building GenAI Applications

MODULE OVERVIEW
Develop end-to-end GenAI applications using LLMs, RAG and agents.

TOPICS COVERED

- End-to-end GenAI application design
- Backend with FastAPI / Python
- Integrating LLMs, RAG & agents
- UI with Streamlit / Gradio
- Testing, logging & monitoring

REAL-WORLD EXAMPLE
Build a GenAI web app (e.g., document Q&A; or research bot).

PRACTICE PROJECT
Develop and deploy a full GenAI application (backend + UI).

MODULE 08 | 18 Hours | Weeks 15–16
Model Evaluation, Safety & Responsible AI

MODULE OVERVIEW
Ensure GenAI applications are accurate, reliable, fair and safe for real-world use.

TOPICS COVERED

- LLM evaluation metrics (quality, relevance)
- Hallucination detection & mitigation
- Bias, fairness & safety considerations
- Guardrails & content moderation
- Cost, latency & performance optimization

REAL-WORLD EXAMPLE
Evaluate and improve LLM response quality and safety.

PRACTICE PROJECT
Build an evaluation framework for your GenAI or RAG application.

MODULE 09 | 18 Hours | Week 17
AI Solution Architecture & System Design

MODULE OVERVIEW
Design scalable, production-ready GenAI solutions for real-world business use cases.

TOPICS COVERED

- End-to-end GenAI solution architecture
- Scalable & reliable system design
- Data, model & application integration
- Security, privacy & access controls
- Cost, performance & optimization

REAL-WORLD EXAMPLE
Design an enterprise GenAI solution (e.g., knowledge assistant).

PRACTICE PROJECT
Create a detailed architecture & design document for a GenAI solution.

MODULE 10 | 18 Hours | Week 18
Data Governance & Enterprise AI

MODULE OVERVIEW
Learn governance, compliance and responsible AI for enterprise-grade GenAI adoption.

TOPICS COVERED

- Data governance & quality for AI
- Access control, privacy & compliance
- Responsible & ethical AI practices
- Model risk management
- Enterprise AI adoption best practices

REAL-WORLD EXAMPLE
Implement governance and tracking for an AI project using policies.

PRACTICE PROJECT
Set up data governance, access controls and audit tracking.

MODULE 11 | 20 Hours | Weeks 19–20
Capstone Project & Career Preparation

MODULE OVERVIEW
Apply all the learned concepts to build a complete end-to-end GenAI solution and get career-ready.

TOPICS COVERED

- End-to-end real-world AI project
- Problem definition, design & implementation
- Solution evaluation, testing & documentation
- Resume building, interview preparation
- Mock interviews & career guidance

REAL-WORLD EXAMPLE
Build a production-ready GenAI or Agentic AI solution for a business use case.

PRACTICE PROJECT
Build, deploy and present a complete AI solution with documentation & demo.

KEY LEARNING OUTCOMES & CAREER OPPORTUNITIES

KEY LEARNING OUTCOMES

- ✓ Build end-to-end GenAI and Agentic AI applications
- ✓ Design robust RAG pipelines and AI agents
- ✓ Use modern AI tools, frameworks and cloud platforms
- ✓ Apply responsible AI, evaluation and governance
- ✓ Design scalable and maintainable AI solutions
- ✓ Create a strong project portfolio for career growth

CAREER OPPORTUNITIES

➤ **AI/ML Engineer**	➤ **AI Solution Architect**
➤ **Generative AI Engineer**	➤ **Data & AI Engineer**
➤ **Agentic AI Developer**	➤ **AI Platform Engineer**
➤ **LLM Application Developer**	➤ **AI Product Engineer**
➤ **RAG Engineer**	➤ **Generative AI Consultant**

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