

Generative AI Engineering (Job-Ready Course)

SECTION 1: Python & AI Foundations

What you will learn:

- Python fundamentals & syntax
- Variables, functions & OOP concepts
- Virtual environments & package management
- VS Code, Git & GitHub setup
- Jupyter Notebook & Google Colab

Minor Projects:

- Python Mini Projects
- CLI AI Utilities

Major Projects:

- AI Development Environment Setup

SECTION 2: Machine Learning & Deep Learning Basics

What you will learn:

- Supervised & unsupervised learning
- Neural network fundamentals
- TensorFlow & PyTorch introduction
- Embeddings & vector representations
- Deep learning workflows

Minor Projects:

- ML Prediction Model
- Basic Neural Network

Major Projects:

- Deep Learning Pipeline Project

SECTION 3: Introduction to Generative AI

What you will learn:

- Fundamentals of Generative AI
- LLMs and Transformer architecture
- Prompt Engineering techniques
- OpenAI & HuggingFace ecosystem
- AI model workflows

Minor Projects:

- Prompt Engineering Playground
- Text Generation App

Major Projects:

- Custom Generative AI Assistant

SECTION 4: LangChain Fundamentals

What you will learn:

- LangChain architecture
- Chains, prompts & memory
- Agents & tools
- Document loaders
- Conversation workflows

Minor Projects:

- Chatbot with Memory
- Document Q&A App

Major Projects:

- Multi-Tool AI Assistant

SECTION 5: HuggingFace & Open Source Models

What you will learn:

- Using HuggingFace Transformers
- Tokenizers & embeddings
- Model fine-tuning basics
- Inference pipelines
- Custom model integration

Minor Projects:

- Text Summarizer
- Sentiment Analysis System

Major Projects:

- Fine-Tuned NLP Application

SECTION 6: Retrieval-Augmented Generation (RAG)

What you will learn:

- RAG architecture & workflows
- Vector databases
- Document indexing
- Semantic search systems
- Embedding optimization

Minor Projects:

- PDF Chatbot
- Knowledge Base Search Engine

Major Projects:

- Enterprise RAG System

SECTION 7: Agentic AI & Automation

What you will learn:

- AI agents & workflows
- LangGraph basics
- Multi-agent systems

- Task automation pipelines
- Tool calling & orchestration

Minor Projects:

- Research AI Agent
- Workflow Automation Bot

Major Projects:

- Autonomous AI Agent System

SECTION 8: AI Deployment & MLOps

What you will learn:

- FastAPI & Flask deployment
- Docker for AI applications
- Cloud deployment using AWS/GCP
- CI/CD for AI systems
- Monitoring & optimization

Minor Projects:

- Deploy AI API
- Dockerized LLM App

Major Projects:

- Production-Ready AI SaaS Deployment

SECTION 9: Real-World Generative AI Projects

What you will learn:

- Portfolio building
- Freelancing guidance
- Industry-level AI architecture
- Resume & LinkedIn optimization
- Interview preparation

Minor Projects:

- AI Resume Builder
- AI Content Generator

Major Projects:

- End-to-End AI SaaS Product

Technologies & Tools Covered

- Python
- LangChain
- LangGraph
- HuggingFace Transformers
- OpenAI APIs
- FastAPI
- Flask
- Docker
- Vector Databases
- TensorFlow
- PyTorch
- AWS/GCP
- Git & GitHub
- Jupyter Notebook