

Agentic AI & Generative AI Engineering (Job-Ready Course)

SECTION 1: Python Programming Foundation

What You Will Learn

- Python syntax & fundamentals
- Functions, modules & packages
- Object-Oriented Programming (OOP)
- Exception handling
- File handling
- Virtual environments & pip
- Logging & debugging
- Best coding practices

Minor Projects

- Calculator CLI
 - File Organizer
 - Student Management System
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SECTION 2: Git, Linux & Development Tools

What You Will Learn

- Git & GitHub
- Branching & Pull Requests
- Linux terminal essentials
- VS Code productivity
- Postman
- Docker basics
- Environment variables
- API testing

Minor Projects

- Git Portfolio
 - REST API Testing
 - Dockerize a Python Application
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SECTION 3: Data Structures, APIs & Backend Foundation

What You Will Learn

- Python Data Structures
- Time Complexity
- REST APIs
- FastAPI
- Request validation
- Async programming
- Dependency Injection
- API documentation

Minor Projects

- Todo REST API
 - Authentication API
 - Weather API Integration
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SECTION 4: SQL, Vector Databases & Data Engineering

What You Will Learn

- PostgreSQL
- SQL Fundamentals
- Database Design
- ORM (SQLAlchemy)
- Redis
- ChromaDB
- FAISS
- Pinecone
- pgvector

Minor Projects

- Employee Management API
 - Semantic Search Engine
 - Document Search System
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SECTION 5: Machine Learning & Deep Learning Foundations

What You Will Learn

- NumPy
- Pandas
- Data Visualization
- Scikit-Learn
- Feature Engineering
- Model Evaluation
- Neural Networks
- PyTorch Basics

Minor Projects

- House Price Prediction
 - Spam Detection
 - Image Classification
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SECTION 6: Large Language Models (LLMs)

What You Will Learn

- Transformers
- Tokenization
- Attention Mechanism
- Hugging Face
- Open Source LLMs
- Llama
- Phi
- Mistral
- Qwen
- Prompt Engineering
- Function Calling
- Structured Outputs

Minor Projects

- AI Resume Reviewer
- AI Email Generator
- AI Coding Assistant

SECTION 7: RAG (Retrieval-Augmented Generation)

What You Will Learn

- Embeddings
- Chunking Strategies
- Vector Search
- Retrieval Pipelines
- Hybrid Search
- Re-ranking
- Evaluation
- Knowledge Bases

Minor Projects

- PDF Chatbot
 - Company Knowledge Assistant
 - Research Paper Assistant
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SECTION 8: LangChain Ecosystem

What You Will Learn

- LangChain Fundamentals
- Chains
- LCEL
- Memory
- Tools
- Output Parsers
- Retrieval Chains
- LangServe

Minor Projects

- Multi-document Chatbot
 - SQL AI Assistant
 - AI Research Assistant
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SECTION 9: LangGraph & Agentic AI

What You Will Learn

- Agent Architecture
- State Management
- Graph-based Workflows
- Multi-Agent Systems
- Human-in-the-loop
- Memory
- Planning
- Reflection
- Tool Calling
- Autonomous Agents

Minor Projects

- Research Agent
- Coding Agent
- Customer Support Agent

Major Project

- Multi-Agent Business Automation System
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SECTION 10: MCP (Model Context Protocol)

What You Will Learn

- MCP Fundamentals
- MCP Architecture
- MCP Servers
- MCP Clients
- Tool Integration
- IDE Integration
- Authentication
- Remote MCP Servers

Minor Projects

- MCP File Server
 - MCP Database Server
 - MCP GitHub Server
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SECTION 11: AI Agents in Production

What You Will Learn

- Agent Memory
- Long-term Memory
- Short-term Memory
- Observability
- Guardrails
- AI Safety
- Cost Optimization
- Prompt Versioning
- Agent Evaluation

Minor Projects

- Production AI Assistant
 - AI Customer Support Agent
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SECTION 12: AI Deployment & MLOps

What You Will Learn

- Docker
- Kubernetes Basics
- CI/CD
- FastAPI Deployment
- AWS/GCP Fundamentals
- Nginx
- Reverse Proxy
- SSL
- Monitoring
- Logging

Minor Projects

- Deploy AI Chatbot
 - Deploy FastAPI Backend
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SECTION 13: AI Product Development

What You Will Learn

- SaaS Architecture
- Authentication
- Payments
- Multi-tenancy
- API Security
- Rate Limiting
- Background Jobs
- WebSockets
- Scaling AI Applications

Major Projects

- AI SaaS Platform
 - AI CRM Assistant
 - AI Customer Support Platform
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SECTION 14: Advanced AI Engineering

What You Will Learn

- AI Evaluations
- LangSmith
- DSPy
- LlamaIndex
- CrewAI
- AutoGen
- OpenAI Agents SDK
- Browser Automation
- Computer Use Agents
- Voice AI
- Vision Models

Major Projects

- AI Coding Assistant
 - Autonomous Research Platform
 - AI Workflow Automation Platform
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SECTION 15: Capstone Industry Projects

Major Projects

- Enterprise RAG Platform
 - AI Legal Assistant
 - AI Healthcare Assistant
 - Financial AI Copilot
 - Autonomous Sales Agent
 - Multi-Agent Recruitment System
 - AI Interview Platform
 - AI Education Platform
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SECTION 16: Certification & Placement Opportunity

What You Will Receive

- Course Completion Certificate
 - Industry Project Evaluation
 - Resume Building Sessions
 - GitHub Portfolio Review
 - Mock Technical Interviews
 - AI Engineer Career Guidance
 - Internship Assistance
 - Placement Opportunity
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Technologies Covered

Programming

- Python
- SQL
- JavaScript (Basics)

Backend

- FastAPI
- Flask
- REST APIs
- WebSockets

AI Frameworks

- LangChain
- LangGraph
- LlamaIndex
- DSPy
- CrewAI
- AutoGen
- OpenAI Agents SDK

LLMs

- GPT
- Claude
- Gemini
- Llama
- Phi
- Mistral
- Qwen

Vector Databases

- ChromaDB
- FAISS
- Pinecone
- pgvector

Databases

- PostgreSQL
- MongoDB
- Redis

Cloud & DevOps

- Docker
- GitHub Actions
- AWS
- GCP
- Nginx
- Linux

Deployment

- Vercel
- Railway
- Render

- VPS
 - Docker Compose
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Career Outcomes

After completing this course, learners will be prepared for roles such as:

- AI Engineer
- Generative AI Engineer
- Agentic AI Engineer
- LLM Engineer
- AI Backend Engineer
- Applied AI Engineer
- ML Engineer
- Prompt Engineer
- AI Product Engineer
- AI Automation Engineer
- RAG Engineer
- AI Solutions Architect (Junior)