COURSE SYLLABUS

Agentic AI Course Syllabus

1 Course Overview

Learn Agentic AI, including Python for AI, large language models, prompt engineering, and building AI agents that use tools and memory. Gain practical skills to design, build, and deploy AI agents that automate real-world tasks.

Agentic AI systems go beyond chatbots. They plan tasks, use tools, call APIs and take actions to reach a goal. Companies are adopting AI agents to automate support, research, data work and software tasks, which creates strong demand for people who can build them.

2 Course Highlights

- Practical training on building AI agents, not just theory
- Hands-on work with LLM APIs, LangChain, RAG and multi-agent workflows
- Hands-on practice with assignments in every module
- Resume building, mock interviews and placement guidance

3 Who Can Join

- Students and fresh graduates who want to start a career in this field
- Working professionals planning a career switch or upskilling
- Developers and IT staff who want to add new skills
- Freelancers and entrepreneurs who want practical, job-ready knowledge

4 Course Syllabus

The course is divided into 7 modules. Each module combines concept sessions with hands-on practice.

MODULE 1 Python and AI Foundations

- Python basics for AI development
- Working with APIs, JSON and environment variables
- Introduction to artificial intelligence and machine learning
- Generative AI and how it differs from traditional AI
- Overview of large language models
- AI tools and the developer setup
- Git and project organization

MODULE 2 Large Language Models and Prompt Engineering

- How LLMs work: tokens, context window and temperature
- Popular LLM providers and APIs
- Writing clear prompts and system instructions
- Few-shot and chain-of-thought prompting
- Structured outputs and JSON responses
- Evaluating and improving prompts
- Limitations, hallucinations and safety

MODULE 3 Introduction to AI Agents and Agentic Design

- What is an AI agent and what makes it agentic
- Agent loop: perceive, plan, act and reflect
- Reasoning patterns such as ReAct
- Single-agent vs multi-agent systems
- Choosing the right agent architecture
- Human-in-the-loop design
- Agent use cases across industries

MODULE 4 Tool Use, Function Calling and Memory

- Function calling and tool definitions
- Connecting agents to web search and APIs
- Working with files, databases and code execution
- Short-term and long-term memory
- Conversation state management
- Model Context Protocol (MCP) basics
- Error handling and retries

MODULE 5 RAG and Vector Databases

- Embeddings and semantic search
- Vector databases such as Chroma and FAISS
- Chunking and document loading
- Building a Retrieval-Augmented Generation (RAG) pipeline
- Improving retrieval quality
- Citing sources in responses
- Evaluating RAG systems

MODULE 6 Agent Frameworks: LangChain, LangGraph and Multi-Agent Systems

- LangChain components: chains, tools and agents
- Building stateful workflows with LangGraph
- Multi-agent collaboration and role design
- Planning and task decomposition
- Agent frameworks overview such as CrewAI
- Observability and debugging agents
- Cost and latency optimization

MODULE 7 Deployment, Safety and Real-World Projects

- Building a simple user interface with Streamlit
- Creating an API with FastAPI
- Deploying agents to the cloud
- Security: prompt injection and data privacy
- Guardrails and responsible AI
- Capstone agent project
- Resume and portfolio preparation

5 Tools and Technologies Covered

Python, LLM APIs, Prompt engineering, LangChain, LangGraph, CrewAI, RAG, Vector databases (Chroma, FAISS), Model Context Protocol (MCP), FastAPI, Streamlit, Git and GitHub, Jupyter Notebook.

6 Hands-On Projects

AI Research Assistant	Agent that searches the web and writes a summary with sources.
Document Q&A; Bot	RAG-based chatbot that answers questions from PDF files.
Customer Support Agent	Agent that uses tools to look up orders and answer queries.
Multi-Agent Workflow	Team of agents that plan, write and review content together.

7 Learning Outcomes

- Understand generative AI, LLMs and agentic AI concepts.
- Write effective prompts and get structured outputs from LLMs.
- Build AI agents that use tools, memory and APIs.
- Create RAG applications using vector databases.
- Design multi-agent workflows with LangChain and LangGraph.
- Deploy AI agents with safety and responsible AI practices.

8 Career Opportunities

- AI Agent Developer
- Generative AI Developer
- LLM Application Developer
- AI Automation Engineer
- Prompt Engineer
- Python Developer (AI focus)

9 Course Details

Duration	As per course schedule
Level	Beginner to Advanced
Mode	Online / Classroom
Prerequisites	Basic computer knowledge; basic Python is helpful
Certification	Course completion certificate
Support	Placement assistance and interview preparation

10 Frequently Asked Questions

Do I need prior experience to join?

No. The course starts from the basics, so beginners can join. The prerequisite listed in the course details is enough.

Will I get hands-on practice?

Yes. Every module includes practical sessions, assignments and a real-world project.

Do you provide placement support?

Yes. We provide resume building, mock interviews and placement guidance.

Can I attend online?

Yes. The course is available in both online and classroom modes.

11 Contact Information

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