

Agentic AI: LangChain, RAG & Open-Source LLMs

Learn to build, evaluate and deploy autonomous AI agents using LangChain, RAG pipelines and open-source LLMs.

6 Days

48 HOURS

14

MODULES

47

TOPICS

3

HANDS-ON ACTIVITIES

COURSE OVERVIEW

This course covers the fundamentals of Agentic AI, including its characteristics, use cases and ethical considerations, before introducing open-source language, vision and multi-modal models such as Llama 2, Bloom, CLIP and Whisper. It then addresses building RAG pipelines that index documents into vector databases and query them with LangChain, followed by open-source tools such as Gradio, Streamlit and Docker for creating and deploying agent systems. Further modules cover building conversational chatbots, evaluating and optimising models with MLflow, fine-tuning open-source models, and deploying them on Azure Cloud. The course closes with responsible AI practices, hands-on agent projects, and emerging trends in Agentic AI.

WHO THIS COURSE IS FOR

AI Engineers

Machine Learning Engineers

Data Scientists

Software Developers

Conversational AI Developers

PREREQUISITES

- Foundational understanding of AI or software development.
- Basic Python programming knowledge along with experience in working with notebooks (Jupyter/Colab) and using common machine learning frameworks such as PyTorch or TensorFlow at an introductory level.
- A general understanding of APIs, JSON, and simple command-line operations will be helpful for building and deploying agents.
- Prior exposure to concepts like embeddings, vector databases, or LLMs is beneficial but not mandatory.

What You Will Learn

By the end of this course, participants will be able to:

- Understand the fundamentals of Agentic AI and its practical applications
- Leverage open-source models (e.g., Llama 2, Bloom, AutoGPT) to build autonomous AI systems
- Create decision-making AI agents for text, vision, and multi-modal tasks
- Evaluate, monitor, and optimize Agentic AI systems using MLflow
- Build conversational AI chatbots using open-source tools for practical use cases

COURSE SYLLABUS

14 Modules, 47 Topics

01

Introduction to Agentic AI

TOPICS

What is Agentic AI? · Characteristics of Agentic AI Systems · Use Cases and Applications · Ethical Considerations and Risks

02

Overview of Open-Source Models for Agentic AI

TOPICS

- Categories of Open-Source Models (Language, Vision, Multi-Modal, Decision-Making)
- Benefits of Using Open-Source Models for Agentic AI
- Popular Frameworks and Libraries

03

Language Models for Agentic AI

TOPICS

- **Hugging Face Transformers:** Overview of GPT models viz., Bloom, Falcon, etc.
- **Llama 2:** Open-source alternative to proprietary models
- **LangChain:** Framework for autonomous AI applications

04

Vision Models for Agentic AI

TOPICS

- **OpenCV and Mediapipe:** Processing visual data
- **CLIP:** Multi-modal understanding of text and images

05

Multi-Modal Models

TOPICS

- **OpenAI Whisper:** Speech-to-text model (open-source)
- **DALL-E Mini:** Image generation and understanding (open-source alternative)
- **DeepMind Perceiver:** Multi-modal task processing

06

2 Labs

RAG Pipelines Indexing PDFs, Docs, APIs into VectorDB and Querying

TOPICS

- Introduction to Retrieval Augmented Generation (RAG)
- Document, PDFs, CSV, indexing
- Introduction to VectorDB
- Working with Weaviate
- Concept of Embedding, Retrieval, Chain and Agents using LangChain
- Hands-On RAG Agent Build (Agentic RAG)

07

Open-Source Tools for Creating Agentic AI Systems

TOPICS

- **LangChain:** Building complex agent workflows
- **Gradio:** Creating interactive user interfaces
- **Streamlit:** Lightweight UIs for Agentic AI applications
- **Docker:** Scaling and deploying open-source AI agents

08**Hands-On**

Building Chatbots with Agentic AI

TOPICS

- Using Llama 2 and Open-Assistant for Conversational Agents
- LangChain for Multi-Turn Conversations and Workflow Automation
- Integrating Gradio or Streamlit for Chatbot UIs

09

Evaluation and Optimization Using MLflow

TOPICS

- Introduction to MLflow for Model Tracking and Experimentation
- Logging Metrics, Parameters, and Artifacts for Agentic AI Models
- Model Versioning and Deployment with MLflow
- Fine-Tuning and Re-Evaluating Open-Source Models Using MLflow

10

Training and Fine-Tuning Open-Source Models

TOPICS

- Customizing Models for Specific Agentic Tasks
- Tools for Model Fine-Tuning (Hugging Face Trainer, PEFT)
- Dataset Preparation for Agentic AI

11

Deployment Process on Azure Cloud (No Labs)

TOPICS

Deploying Open-Source Models in Production · Integrating Models with Azure Cloud Services

12

Ethical and Responsible Use of Agentic AI

TOPICS

- Bias Detection and Mitigation in Open-Source Models
- Transparency in Decision-Making Processes
- Safeguards Against Unintended Outcomes

13

Hands-On Projects

TOPICS

- Building a Text-Based Autonomous Customer Support Agent
- Creating a Multi-Modal Autonomous Data Entry Assistant
- Developing a Vision-Based Inventory Management Agent
- **Case Study:** Building a Task Automation Pipeline with AutoGPT

14

Future Trends in Agentic AI

TOPICS

Advances in Agent Architectures · Evolution of Open-Source Model Ecosystems · Cross-Domain Collaboration in Agentic AI

HANDS-ON ACTIVITIES

Practise What You Learn

#	MODULE	ACTIVITY
06	RAG Pipelines Indexing PDFs, Docs, APIs into VectorDB and Querying	LAB ■ Build a Retrieval Augmented Generation (RAG) Application using LangChain ■ Build an SQL database Agent
08	Building Chatbots with Agentic AI	Hands-On: Building a Task-Specific Chatbot

WHAT IS INCLUDED

Everything You Need to Succeed

- Koenig course material for every module
- Delivery by certified instructors and subject matter experts
- Hands-on exercises throughout the course
- Course completion certificate from Koenig

ABOUT KOENIG

Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

FLEXIBLE DELIVERY

Learn the Way That Suits You

Classroom Training

Live Online Classes (ILO)

Fly-Me-A-Trainer (FMAT)

Flexi (Self-Paced)

1-on-1 Training

Ready to Get Started?

Talk to a learning advisor about schedules, group training and customised delivery.

Visit koenig-solutions.com

✉ info@koenig-solutions.com