KOENIG SOLUTIONS · COURSE OUTLINE

Agentic AI: LangGraph, AutoGen & Agentic RAG

Learn to design, build and deploy multi-agent AI systems and Agentic RAG pipelines using LangGraph, AutoGen and LangChain.

40 Hours	8	46	2
DURATION	MODULES	TOPICS	HANDS-ON ACTIVITIES

COURSE OVERVIEW

This training program is designed to: Build understanding of Agentic AI concepts, architecture, workflows, and real-world business use cases; Enable participants to design and develop ReAct, Reflex, Planning & Multi-Agent systems; Learn to integrate LangChain, LangGraph, AutoGen for complex agentic workflows; Implement Agentic RAG using vector databases and dynamic retrieval logic; Build task-oriented chatbots and autonomous research agents using open-source LLMs (Groq, Llama, Mixtral, etc.); Understand safety, governance, hallucination mitigation, and ethical practices

WHO THIS COURSE IS FOR

- AI Engineers
- Machine Learning Engineers
- Software Developers
- Solution Architects
- Data Scientists
- Chatbot Developers

PREREQUISITES

- Strong programming skills in Python
- Familiarity with virtual environments, pip/conda, notebook environments
- Basic understanding of LLMs, prompt engineering, embeddings & vector DBs
- Experience and access of APIs (OpenAI / Groq / Gemini / Local LLMs)
- Optional but beneficial: Git, Docker, and basic cloud fundamentals

LEARNING OBJECTIVES

What You Will Learn

After successful completion, participants will be able to:

- Architect & build multi-agent systems with role-based collaboration
- Implement ReAct reasoning, tool calling, and memory-augmented conversation
- Create Agentic RAG pipelines for enhanced retrieval & decision making
- Build production-grade AI agents using LangChain, LangGraph & AutoGen
- Integrate vector DBs (Chroma, Pinecone, Weaviate, PGVector) for retrieval tasks
- Apply safety, privacy, governance & Responsible AI guidelines
- Deploy task-automation chatbots integrated with UIs and enterprise workflows

COURSE SYLLABUS

8 Modules, 46 Topics

01

Introduction to Agentic AI

TOPICS

- What is Agentic AI?
- **Evolution:** Rule-based → Generative AI → Agentic AI
- Characteristics of Agentic AI systems
- Generative AI vs Agentic AI (comparison matrix)
- Real-world use cases & enterprise applications
- **Architectural limitations:** hallucination, prompt dependency, tool reliability

GOVERNANCE CONSIDERATIONS

- Data security, access control, logging
- Responsible AI frameworks
- Safety guardrails & enterprise approval workflows

02

Architecture of Agentic AI Systems

TOPICS

- Reflex Agents
- ReAct Agents (Reasoning + Acting)
- Planning Agents (Planner + Executor)
- Multi-Agent Systems (collaborative agent teams)
- Agent lifecycle & workflow orchestration

SOLUTION ARCHITECTURE EXAMPLES

- Tools, memory, RAG, orchestration
- Hallucination mitigation
- Critic agent, self-reflection, model consensus, verification agents

03

Agentic Frameworks Overview

TOPICS

- LangChain fundamentals
- **LangGraph introduction:** graph-based agent orchestration
- AutoGen framework
- Tools, memory, function calling & control logic
- Ethical considerations & risks

04

Building Chatbots with Agentic AI

TOPICS

- Using Llama-2 / Groq / Open-Assistant / Mixtral
- Multi-turn conversation management with LangChain
- Agent memory, persona & conversation style
- **UI Integration:** Gradio / Streamlit

HANDS-ON LAB

- Build a task-specific chatbot

05

Working with AutoGen

TOPICS

AutoGen architecture & building blocks · ReAct pattern implementation · Multi-agent collaboration & negotiation · RAG + function calling inside AutoGen

LAB

- Multi-agent communication simulation & role assignment

06

Multi-Agent Systems

TOPICS

Agent collaboration & task delegation · Intent detection → agent routing → execution · Enterprise use cases · Reference architecture blueprint · Failure handling & fallback models

07

Agentic Retrieval-Augmented Generation (RAG)

TOPICS

- **Refresh:** classical RAG pipeline

WHAT IS AGENTIC RAG?

- Retrieval + validation + synthesis
- Dynamic decision-making
- Tool-driven reasoning & self-checking
- Vector DB integration (Chroma, Pinecone, Weaviate, PGVector)
- **Project:** Research Analyst Assistant + Self-Verification Agent

08

Ethical & Responsible AI

TOPICS

- Bias detection & mitigation
- Transparency & observability
- Safeguards & unintended outcome avoidance
- Prompt injection defense & cybersecurity considerations
- Enterprise governance & compliance frameworks

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.

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Classroom Training | Live Online Classes (ILO) | Fly-Me-A-Trainer (FMAT) | Flexi (Self-Paced) | 1-on-1 Training

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