Course Overview

Hello, and welcome to the **Fundamentals of Building AI Agents** course.

This course is designed for aspiring software engineers, data scientists, machine learning engineers, AI architects, and automation engineers. It equips you with the knowledge and skills to develop and integrate intelligent AI agents. You'll explore foundational concepts like tool calling, understanding how large language models (LLMs) can leverage external capabilities. You'll also learn to orchestrate complex workflows using chaining, specifically with LangChain Expression Language (LCEL).

As you progress, you'll master building custom AI tools and defining agent behaviors to create smarter, task-driven AI applications. Through hands-on labs, you'll implement both manual and built-in tool calling techniques, apply best practices for agent performance, and develop practical applications for data analysis, visualization, and database interaction. By the end, you'll have the expertise to design and implement powerful AI agent solutions effectively.

This course is part of the **IBM RAG and Agentic AI Professional Certificate**, designed to provide you with the practical skills and knowledge to excel in developing advanced AI applications that leverage retrieval-augmented generation (RAG), multimodal AI, and agentic AI systems.

Prerequisites

Python programming skills and experience are essential for this course, as you will immediately start building AI agents. Additionally, familiarity with core AI concepts and the LangChain framework is highly recommended. Here are some recommended courses if you are not familiar with the prerequisites:

- Python for Data Science, AI & Development
- Develop Generative AI Applications: Get Started

Objectives

After completing this course, you will be able to:

- Develop AI agents that manually invoke tools for greater control over execution and reliability
- Implement tool calling and chaining to create structured AI workflows
- Use built-in LangChain agents to analyze data, generate visualizations, and execute database queries
- Apply best practices in prompt engineering and tool orchestration to enhance AI agent