

Mastering Azure AI & Agentic AI

Duration: 4 Days (32 Hours)

Course Overview

This intensive 4-day program delivers a comprehensive, hands-on journey through Azure AI and Agentic AI — from foundational AI services and Azure AI Foundry to building and deploying production-grade AI applications. Participants begin with core Azure AI capabilities including NLP, Computer Vision, Document Intelligence, and Speech, before progressing to Generative AI — covering model deployment, prompt engineering, RAG pipelines, and cognitive search. The second half of the course focuses on Agentic AI development: participants will design and build single-agent solutions using the Azure AI Foundry Agent Service, then advance to multi-agent orchestration, the Microsoft Agent Framework SDK, MCP tool integration, AI-to-AI communication, and enterprise-grade security, governance, and responsible AI practices. Each day includes structured lab exercises to reinforce practical skills end-to-end.

Pre-requisites

- Basic understanding of cloud computing concepts and familiarity with the Azure portal
- Foundational knowledge of AI and Machine Learning — understanding of models, training, and inference
- Familiarity with Python programming — functions, loops, libraries, and basic scripting
- Basic awareness of REST APIs and JSON
- Prior exposure to Azure AI Services is recommended.

Azure Subscription Requirements for Lab Exercises

Important: Please note that the student must have their own active azure subscription to perform labs.

- A Pay-As-You-Go (PAYG) Azure subscription is required — Free Trial, Student, and Visual Studio Dev/Test subscriptions will not work for the lab exercises.
- Each participant must have their own individual subscription.
- You will need to request Azure OpenAI quota access in advance, as approval can take up to 24 hours.
- Recommended regions: East US, East US 2, or Sweden Central.

Course Agenda

Day 1 — Azure AI Introduction, Capabilities and Exploring Foundry

- Introduction to Azure AI Services

- Introduction to Azure AI Foundry
- Deep Dive in the architecture and workspace components
- Analyse text using Natural Language Processing
- Develop Vision capabilities using Computer Vision
- Extract text using Document Intelligence
- Develop Knowledge Mining Solutions
- Explore Speech service in Azure AI Foundry

Labs:

- *Lab 1: Explore Azure AI Services*
- *Lab 2: Explore Computer Vision*
- *Lab 3: Explore text analytics*
- *Lab 4: Explore object detection*

Day 2 — Develop Solutions Using Generative AI

- Explore the model catalogue and deploy foundation models
- Cost optimization & Performance Tuning
- Build and deploy a Generative AI application
- Prompt engineering techniques and best practices
- Manage endpoints and optimize model usage
- Understand Retrieval Augmented Generation (RAG)
- Configure Cognitive Search and index enterprise data

Labs:

- *Lab 5: Explore Azure AI Studio workspace and deploy a model*
- *Lab 6: Perform prompt engineering experiments*
- *Lab 7: Build a Generative AI chat application with Azure OpenAI*
- *Lab 8: Create a RAG solution using own data in AI Foundry*

Day 3 — Introduction to Agentic AI & Single-Agent Development

- Create content filters
- Evaluate models in Azure AI Foundry
- Introduction to Agentic AI concepts and use cases
- AI Agents vs Azure AI Agents
- Overview of Azure AI Agents and Agent Service
- Develop an AI Agent with Azure AI Foundry Agent Service
- Tool Calling and Function Calling mechanisms

- Deploy and test agents with Azure AI Foundry SDK

Labs:

- *Lab 9: Content filter for Generative AI*
- *Lab 10: Evaluate models in Azure AI Foundry*
- *Lab 11: Create a single agent with built-in tools*

Day 4 — Multi-Agent Solutions, SDK Framework & Management

- Develop multi-agent solutions with Azure AI Foundry Agent Service
- Implement multi-agent collaboration and orchestration patterns
- Develop agents using the Microsoft Agent Framework SDK
- Orchestrate multi-agent solutions with the Agent Framework
- Integrate MCP (Model Context Protocol) Tools with Azure AI Agents
- Discover agents and enable A2A communication (AI-to-AI)
- Manage and administer agents via Management Centre
- Security, Governance & Responsible AI

Labs:

- *Lab 12: Connect and test MCP tools integration*
- *Lab 13: Implement Agent Framework SDK for multi-agent orchestration*
- *Lab 14: Explore A2A communication and agent discovery*
- *Lab 15: Build a multi-agent solution using Foundry Agent Service*