

AI-102: Develop AI Solutions in Azure (5 Days)

Course Overview

AI-102: Develop AI solutions in Azure is intended for software developers wanting to build AI infused applications that leverage Azure AI Foundry and other Azure AI services. Topics in this course include developing generative AI apps, building AI agents, and solutions that implement computer vision and information extraction.

This course is designed for software engineers concerned with building, managing and deploying AI solutions that leverage Azure AI Foundry and other Azure AI services.

Course Benefits

- Describe considerations for AI-enabled application development.
- Create, configure, deploy, and secure Azure Cognitive Services.
- Develop applications that analyze text.
- Develop speech-enabled applications.
- Create applications with natural language understanding capabilities.
- Create QnA applications.
- Create conversational solutions with bots.
- Use computer vision services to analyze images and videos.
- Create custom computer vision models.
- Develop applications that detect, analyze, and recognize faces.
- Develop applications that read and process text in images and documents.
- Create intelligent search solutions for knowledge mining.

Class Prerequisites

Experience in the following is *required* for this AI class:

- Knowledge of Microsoft Azure and ability to navigate the Azure portal.
- Knowledge of either C# or Python.
- Familiarity with JSON and REST programming semantics.
- Familiarity with Azure Foundry.

Course Outline

Plan and prepare to develop AI solutions on Azure

- What is AI?
- Azure AI services
- Azure AI Foundry
- Developer tools and SDKs
- Responsible AI

Choose and deploy models from the model catalog in Azure AI Foundry portal

- Explore the model catalog
- Deploy a model to an endpoint
- Optimize model performance

Develop an AI app with the Azure AI Foundry SDK

- What is the Azure AI Foundry SDK?
- Work with project connections
- Create a chat client

Get started with prompt flow to develop language model apps in the Azure AI Foundry

- Understand the development lifecycle of a large language model (LLM) app
- Understand core components and explore flow types
- Explore connections and runtimes
- Explore variants and monitoring options

Develop a RAG-based solution with your own data using Azure AI Foundry

- Understand how to ground your language model
- Make your data searchable
- Create a RAG-based client application
- Implement RAG in a prompt flow

Fine-tune a language model with Azure AI Foundry

- Understand when to fine-tune a language model
- Prepare your data to fine-tune a chat completion model
- Explore fine-tuning language models in Azure AI Foundry portal

Implement a responsible generative AI solution in Azure AI Foundry

- Plan a responsible generative AI solution
- Map potential harms
- Measure potential harms
- Mitigate potential harms
- Manage a responsible generative AI solution

Evaluate generative AI performance in Azure AI Foundry portal

- Assess the model performance
- Manually evaluate the performance of a model
- Automated evaluations

Get started with AI agent development on Azure

- What are AI agents?
- Options for agent development
- Azure AI Foundry Agent Service

Develop an AI agent with Azure AI Foundry Agent Service

- What is an AI agent
- How to use Azure AI Foundry Agent Service
- Develop agents with the Azure AI Foundry Agent Service

Integrate custom tools into your agent

- Why use custom tools
- Options for implementing custom tools
- How to integrate custom tools

Develop a multi-agent solution with Azure AI Foundry Agent Service

- Understand connected agents
- Design a multi-agent solution with connected agents

Integrate MCP Tools with Azure AI Agents

- Understand MCP tool discovery
- Integrate agent tools using an MCP server and client
- Use Azure AI agents with MCP servers

Develop an AI agent with Microsoft Agent Framework

- Understand Microsoft Agent Framework AI agents
- Create an Azure AI agent with Microsoft Agent Framework
- Add tools to Azure AI agent
- Knowledge check

Orchestrate a multi-agent solution using the Microsoft Agent Framework

- Understand the Microsoft Agent Framework
- Understand agent orchestration
- Use concurrent orchestration
- Use sequential orchestration
- Use group chat orchestration
- Use handoff orchestration
- Use Magentic orchestration
- Knowledge check

Discover Azure AI Agents with A2A

- Define an A2A agent
- Implement an agent executor
- Host an A2A server
- Connect to your A2A agent

Analyze text with Azure AI Language

- Provision an Azure AI Language resource
- Detect language
- Extract key phrases
- Analyze sentiment

- Extract entities
- Extract linked entities

Create question answering solutions with Azure AI Language

- Understand question answering
- Compare question answering to Azure AI Language understanding
- Create a knowledge base
- Implement multi-turn conversation
- Test and publish a knowledge base
- Use a knowledge base
- Improve question answering performance

Build a conversational language understanding model

- Understand prebuilt capabilities of the Azure AI Language service
- Understand resources for building a conversational language understanding model
- Define intents, utterances, and entities
- Use patterns to differentiate similar utterances
- Use pre-built entity components
- Train, test, publish, and review a conversational language understanding model

Create custom text classification solutions

- Understand types of classification projects
- Understand how to build text classification projects

Custom named entity recognition

- Understand custom named entity recognition
- Train and evaluate your model

Translate text with Azure AI Translator service

- Provision an Azure AI Translator resource
- Specify translation options
- Define custom translations

Create speech-enabled apps with Azure AI services

- Provision an Azure resource for speech
- Use the Azure AI Speech to Text API
- Use the text to speech API
- Configure audio format and voices
- Use Speech Synthesis Markup Language

Translate speech with the Azure AI Speech service

- Provision an Azure resource for speech translation
- Translate speech to text
- Synthesize translations

Develop an audio-enabled generative AI application

- Deploy a multimodal model
- Develop an audio-based chat app

Develop an Azure AI Voice Live agent

- Explore the Azure Voice Live API
- Explore the AI Voice Live client library for Python

Analyze images

- Provision an Azure AI Vision resource
- Analyze an image

Read text in images

- Explore Azure AI options for reading text
- Read text with Azure AI Vision Image Analysis

Detect, analyze, and recognize faces

- Plan a face detection, analysis, or recognition solution
- Detect and analyze faces
- Verify and identify faces
- Responsible AI considerations for face-based solutions

Classify images

- Azure AI Custom Vision
- Train an image classification model
- Create an image classification client application

Detect objects in images

- Use Azure AI Custom Vision for object detection
- Train an object detector
- Develop an object detection client application

Analyze video

- Understand Azure Video Indexer capabilities
- Extract custom insights
- Use Video Analyzer widgets and APIs

Develop a vision-enabled generative AI application

- Deploy a multimodal model
- Develop a vision-based chat app

Generate images with AI

- What are image-generation models?
- Explore image-generation models in Azure AI Foundry portal
- Create a client application that uses an image generation model

Create a multimodal analysis solution with Azure AI Content Understanding

- What is Azure AI Content Understanding?
- Create a Content Understanding analyzer
- Use the Content Understanding REST API

Create an Azure AI Content Understanding client application

- Prepare to use the AI Content Understanding REST API
- Create a Content Understanding analyzer
- Analyze content

Use prebuilt Document intelligence models

- Understand prebuilt models
- Use the General Document, Read, and Layout models
- Use financial, ID, and tax models

Extract data from forms with Azure Document intelligence

- What is Azure Document Intelligence?
- Get started with Azure Document Intelligence
- Train custom models
- Use Azure Document Intelligence models
- Use the Azure Document Intelligence Studio

Create a knowledge mining solution with Azure AI Search

- What is Azure AI Search?
- Extract data with an indexer
- Enrich extracted data with AI skills
- Search an index
- Persist extracted information in a knowledge store