Generative AI for .NET Developers with Azure AI Services

Duration: 5 Days
Audience: .NET Developers, Cloud Engineers, Solution Architects
Mode: Instructor-led, Hands-on

Course Objectives

- Understand the fundamentals of Generative AI and its integration in enterprise .NET applications.
- Learn how to use **Azure OpenAI Services** and **Azure Cognitive Services** with C# and .NET APIs.
- Build intelligent applications using **LLMs**, **prompt engineering**, and **Azure AI Studio**.
- Develop end-to-end **AI-powered solutions** (chatbots, document intelligence, summarization).
- Apply best practices for **Responsible AI**, governance, and performance optimization.

Learning Outcomes

After completing this course, participants will be able to:

- Integrate Azure AI models into .NET applications via REST or SDKs.
- Develop intelligent features like text generation, image analysis, and Q&A bots.
- Use Azure AI Studio and OpenAI Playground for testing and prototyping.
- Implement Responsible AI principles and monitor deployed models.

Course Agenda

Day 1 – Introduction to Generative AI and Azure AI Ecosystem

Topics Covered:

- Introduction to AI, ML, and Generative AI concepts
- Overview of Azure AI Services and Azure OpenAI
- Understanding LLMs (GPT, Codex, DALL·E)
- Azure AI architecture and developer tools
- Azure AI Studio and Playground demo

Lab:

- Create an Azure OpenAI resource
- Generate text and image outputs using Azure OpenAI Playground

Outcome:
Participants understand the Azure AI ecosystem and can perform their first model interaction.

Day 2 – Integrating Azure AI with .NET Applications

Topics Covered:

- Connecting .NET with Azure OpenAI via REST and SDK
- Using Azure.Identity and Azure.AI.OpenAI packages
- Text completion, summarization, and content generation
- Handling authentication and environment variables securely

Lab:

- Build a .NET console app that connects to Azure OpenAI
- Create an API endpoint to generate summaries for user input

Outcome:
Participants can successfully call AI models from .NET and process responses.

Day 3 – Cognitive Services for .NET Developers

Topics Covered:

- Overview of Azure Cognitive Services (Vision, Language, Speech)
- Text Analytics API for sentiment and entity extraction
- Azure Computer Vision API for image analysis
- Azure Speech API for text-to-speech and transcription

Lab:

- Implement document summarization and keyword extraction
- Build a .NET web app integrating speech and vision services

Outcome:
Participants can integrate multiple Azure AI services into a single .NET application.

Day 4 – Building Intelligent Applications

Topics Covered:

- Prompt engineering and fine-tuning overview
- Building chatbots using Azure OpenAI and Bot Framework
- Orchestrating AI workflows using Azure Functions
- Storing and retrieving context with Azure Cosmos DB

Lab:

- Develop an AI-powered chatbot using Azure OpenAI and C#
- Integrate context retrieval and memory into the chatbot

Outcome:
Participants can build conversational .NET apps enhanced by Generative AI.

Day 5 – Responsible AI, Deployment, and Performance

Topics Covered:

- Responsible AI principles and governance
- API rate limits, cost optimization, and performance tuning
- Monitoring, scaling, and deploying AI-powered .NET apps on Azure
- Future roadmap: Copilot extensions and AI in Visual Studio

Lab:

- Deploy the chatbot to Azure App Service
- Add logging and Responsible AI monitoring

Outcome:
Participants can deploy, monitor, and maintain Generative AI applications responsibly.

Tools & Environment Setup

Software Requirements:

- Visual Studio 2022 (latest)
- .NET 6 or higher
- Azure Subscription with AI access