

AI-102T00: Designing and Implementing a Microsoft Azure AI Solution

Course Summary

Description

AI-102 Designing and Implementing an Azure AI Solution is intended for software developers wanting to build AI infused applications that leverage Azure Cognitive Services, Azure Cognitive Search, and Microsoft Bot Framework. The course will use C# or Python as the programming language.

Objectives

At the end of this course, students will be able to:

- 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

Topics

- Introduction to AI on Azure
- Developing AI Apps with Cognitive Services
- Getting Started with Natural Language Processing
- Building Speech-Enabled Applications
- Creating Language Understanding Solutions
- Building a QnA Solution
- Conversational AI and the Azure Bot Service
- Getting Started with Computer Vision
- Developing Custom Vision Solutions
- Detecting, Analyzing, and Recognizing Faces
- Reading Text in Images and Documents
- Creating a Knowledge Mining Solution

Audience

Software engineers concerned with building, managing and deploying AI solutions that leverage Azure Cognitive Services, Azure Cognitive Search, and Microsoft Bot Framework. They are familiar with C# or Python and have knowledge on using REST-based APIs to build computer vision, language analysis, knowledge mining, intelligent search, and conversational AI solutions on Azure.

Prerequisites

Before attending this course, students must have:

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

Duration

Four days

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Course Outline

I. Introduction to AI on Azure

Artificial Intelligence (AI) is increasingly at the core of modern apps and services. In this module, you'll learn about some common AI capabilities that you can leverage in your apps, and how those capabilities are implemented in Microsoft Azure. You'll also learn about some considerations for designing and implementing AI solutions responsibly.

- A. Introduction to Artificial Intelligence
- B. Artificial Intelligence in Azure

II. Developing AI Apps with Cognitive Services

Cognitive Services are the core building blocks for integrating AI capabilities into your apps. In this module, you'll learn how to provision, secure, monitor, and deploy cognitive services.

- A. Getting Started with Cognitive Services
- B. Using Cognitive Services for Enterprise Applications
 - Lab : Get Started with Cognitive Services
 - Lab : Manage Cognitive Services Security
 - Lab : Monitor Cognitive Services
 - Lab : Use a Cognitive Services Container

III. Getting Started with Natural Language Processing

Natural Language processing (NLP) is a branch of artificial intelligence that deals with extracting insights from written or spoken language. In this module, you'll learn how to use cognitive services to analyze and translate text.

- A. Analyzing Text
- B. Translating Text
 - Lab : Analyze Text
 - Lab : Translate Text

IV. Building Speech-Enabled Applications

Many modern apps and services accept spoken input and can respond by synthesizing text. In this module, you'll continue your exploration of natural language processing capabilities by

learning how to build speech-enabled applications.

- A. Speech Recognition and Synthesis
- B. Speech Translation
 - Lab : Recognize and Synthesize Speech
 - Lab : Translate Speech

V. Creating Language Understanding Solutions

To build an application that can intelligently understand and respond to natural language input, you must define and train a model for language understanding. In this module, you'll learn how to use the Language Understanding service to create an app that can identify user intent from natural language input.

- A. Creating a Language Understanding App
- B. Publishing and Using a Language Understanding App
- C. Using Language Understanding with Speech
 - Lab : Create a Language Understanding App
 - Lab : Create a Language Understanding Client Application
 - Lab : Use the Speech and Language Understanding Services

VI. Building a QnA Solution

One of the most common kinds of interaction between users and AI software agents is for users to submit questions in natural language, and for the AI agent to respond intelligently with an appropriate answer. In this module, you'll explore how the QnA Maker service enables the development of this kind of solution.

- A. Creating a QnA Knowledge Base
- B. Publishing and Using a QnA Knowledge Base
 - Lab : Create a QnA Solution

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Course Outline (cont'd)

VII. *Conversational AI and the Azure Bot Service*

Bots are the basis for an increasingly common kind of AI application in which users engage in conversations with AI agents, often as they would with a human agent. In this module, you'll explore the Microsoft Bot Framework and the Azure Bot Service, which together provide a platform for creating and delivering conversational experiences.

- A. Bot Basics
- B. Implementing a Conversational Bot
 - Lab : Create a Bot with the Bot Framework SDK
 - Lab : Create a Bot with Bot Framework Composer

VIII. *Getting Started with Computer Vision*

Computer vision is an area of artificial intelligence in which software applications interpret visual input from images or video. In this module, you'll start your exploration of computer vision by learning how to use cognitive services to analyze images and video.

- A. Analyzing Images
- B. Analyzing Videos
 - Lab : Analyze Images with Computer Vision
 - Lab : Analyze Video with Video Indexer

IX. *Developing Custom Vision Solutions*

While there are many scenarios where pre-defined general computer vision capabilities can be useful, sometimes you need to train a custom model with your own visual data. In this module, you'll explore the Custom Vision service, and how to use it to create custom image classification and object detection models.

- A. Image Classification
- B. Object Detection
 - Lab : Classify Images with Custom Vision
 - Lab : Detect Objects in Images with Custom Vision

X. *Detecting, Analyzing, and Recognizing Faces*

Facial detection, analysis, and recognition are common computer vision scenarios. In this module, you'll explore the user of cognitive services to identify human faces.

- A. Detecting Faces with the Computer Vision Service
- B. Using the Face Service
 - Lab : Detect, Analyze, and Recognize Faces

XI. *Reading Text in Images and Documents*

Optical character recognition (OCR) is another common computer vision scenario, in which software extracts text from images or documents. In this module, you'll explore cognitive services that can be used to detect and read text in images, documents, and forms.

- A. Reading text with the Computer Vision Service
- B. Extracting Information from Forms with the Form Recognizer service
 - Lab : Read Text in Images
 - Lab : Extract Data from Forms

XII. *Creating a Knowledge Mining Solution*

Ultimately, many AI scenarios involve intelligently searching for information based on user queries. AI-powered knowledge mining is an increasingly important way to build intelligent search solutions that use AI to extract insights from large repositories of digital data and enable users to find and analyze those insights.

- A. Implementing an Intelligent Search Solution
- B. Developing Custom Skills for an Enrichment Pipeline
- C. Creating a Knowledge Store
 - Lab : Create an Azure Cognitive Search solution
 - Lab : Create a Custom Skill for Azure Cognitive Search
 - Lab : Create a Knowledge Store with Azure Cognitive Search