

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

### Course Details

**Course Code:** AI-102T00

**Duration:** 4 days

#### Notes:

- This course syllabus should be used to determine whether the course is appropriate for the students, based on their current skills and technical training needs.
- Course content, prices, and availability are subject to change without notice.
- Terms and Conditions apply

*Elements of this syllabus are subject to change.*

#### About this course

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.

#### Audience Profile

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.

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### Prepare to develop AI solutions on Azure

As an aspiring Azure AI Engineer, you should understand core concepts and principles of AI development, and the capabilities of Azure services used in AI solutions.

#### Learning objectives

After completing this module, you will be able to:

- Define artificial intelligence
- Understand AI-related terms
- Understand considerations for AI Engineers
- Understand considerations for responsible AI
- Understand capabilities of Azure Machine Learning
- Understand capabilities of Azure AI Services
- Understand capabilities of the Azure Bot Service
- Understand capabilities of Azure Cognitive Search

### Create and consume Azure AI Services

Azure AI Services enable developers to easily add AI capabilities into their applications. Learn how to create and consume these services.

#### Learning objectives

After completing this module, you will be able to:

- Provision Azure AI Services resources in an Azure subscription.
- Identify endpoints, keys, and locations required to consume an Azure AI Services resource.
- Use a REST API to consume an Azure AI service.
- Use an SDK to consume an Azure AI service.

### Secure Azure AI Services

Securing Azure AI Services can help prevent data loss and privacy violations for user data that may be a part of the solution.

#### Learning objectives

After completing this module, you will know how to:

- Consider authentication for Azure AI Services

- Manage network security for Azure AI Services

### Monitor Azure AI Services

Azure AI Services enable you to integrate artificial intelligence into your applications and services. It's important to be able to monitor Azure AI Services in order to track utilization, determine trends, and detect and troubleshoot issues.

#### Learning objectives

After completing this module, you will be able to:

- Monitor Azure AI Services costs
- Create alerts
- View metrics
- Manage diagnostic logging

### Deploy Azure AI services in containers

Learn about Container support in Azure AI Services allowing the use of APIs available in Azure and enable flexibility in where to deploy and host the services with Docker containers.

#### Learning objectives

After completing this module, learners will be able to:

- Create Containers for Reuse
- Deploy to a Container
- Secure a Container
- Consume Azure AI Services from a Container

### Extract insights from text with the Azure AI Language service

The Azure AI Language service enables you to create intelligent apps and services that extract semantic information from text.

#### Learning objectives

In this module, you will learn how to use the Azure AI Language service to:

- Detect language
- Extract key phrases
- Analyse sentiment
- Extract entities
- Extract linked entities

### Translate text with the Azure AI Translator service

The Azure AI Translator service enables you to create intelligent apps and services that can translate text between languages.

#### Learning objectives

After completing this module, you'll be able to:

- Provision an Azure AI Translator resource
- Understand language detection, translation, and transliteration
- Specify translation options
- Define custom translations

### Create speech-enabled apps with Azure AI services

The Azure AI Speech service enables you to build speech-enabled applications. This module focuses on using the speech-to-text and text to speech APIs, which enable you to create apps that are capable of speech recognition and speech synthesis.

#### Learning objectives

In this module, you'll learn how to:

- Provision an Azure resource for the Azure AI Speech service
- Use the Azure AI Speech to text API to implement speech recognition
- Use the Text to speech API to implement speech synthesis
- Configure audio format and voices
- Use Speech Synthesis Markup Language (SSML)

### Translate speech with the Azure AI Speech service

Translation of speech builds on speech recognition by recognizing and transcribing spoken input in a specified language, and returning translations of the transcription in one or more other languages.

#### Learning objectives

In this module, you will learn how to:

- Provision Azure resources for speech translation.
- Generate text translation from speech.
- Synthesize spoken translations.

### Build a conversational language understanding model

The Azure AI Language conversational language understanding service (CLU) enables you to train a model that apps can use to extract meaning from natural language.

#### Learning objectives

After completing this module, you'll be able to:

- Provision Azure resources for Azure AI Language resource
- Define intents, utterances, and entities
- Use patterns to differentiate similar utterances
- Use pre-built entity components
- Train, test, publish, and review an Azure AI Language model

### Publish and use an Azure AI Language Understanding app

After creating an Azure AI Language Understanding app, you can publish it and consume it from client applications.

#### Learning objectives

After completing this module, you'll be able to:

- Understand capabilities of an Azure AI Language Understanding app
- Process predictions from an Azure AI Language Understanding app
- Deploy an Azure AI Language understanding app in a container

### Build a question answering solution

The question answering capability of the Azure AI Language service makes it easy to build applications in which users ask questions using natural language and receive appropriate answers.

#### Learning objectives

After completing this module, you will be able to:

- Understand question answering
- Compare question answering to language understanding
- Create a knowledge base
- Implement multi-turn conversation
- Test and publish a knowledge base
- Consume a knowledge base
- Implement active learning
- Create a question answering bot

### Create a bot with the Bot Framework SDK

Learn how to build a bot by using the Microsoft Bot Framework SDK.

#### Learning objectives

After completing this module, you will be able to:

- Understand principles of bot design
- Use the Bot Framework SDK to build a bot
- Deploy a bot to Azure

### Create a Bot with the Bot Framework Composer

User the Bot Framework Composer to quickly and easily build sophisticated conversational bots without writing code.

#### Learning objectives

After completing this module, you will be able to:

- Understand dialogs
- Plan conversational flow
- Design the user experience
- Create a bot with the Bot Framework Composer

### Analyze images

With the Azure AI Vision service, you can use pre-trained models to analyze images and extract insights and information from them.

#### Learning objectives

After completing this module, you'll be able to:

- Provision an Azure AI Vision resource
- Analyze an image
- Generate a smart-cropped thumbnail

### Analyze video

Azure Video Indexer is a service to extract insights from video, including face identification,

text recognition, object labels, scene segmentations, and more.

#### Learning objectives

After completing this module, you'll be able to:

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

### Classify images

Image classification is used to determine the main subject of an image. You can use the Azure AI Custom Vision services to train a model that classifies images based on your own categorizations.

#### Learning objectives

After completing this module, you will be able to:

- Provision Azure resources for Azure AI Custom Vision
- Understand image classification
- Train an image classifier

### Detect objects in images

Object detection is used to locate and identify objects in images. You can use Azure AI Custom Vision to train a model to detect specific classes of object in images.

#### Learning objectives

After completing this module, you will be able to:

Provision Azure resources for Azure AI Custom Vision

- Understand object detection
- Train an object detector
- Consider options for labelling images

### Detect, analyze, and recognize faces

The ability for applications to detect human faces, analyze facial features and emotions, and identify individuals is a key artificial intelligence capability.

#### Learning objectives

After completing this module, you will be able to:

- Identify options for face detection, analysis, and identification
- Understand considerations for face analysis
- Detect faces with the Azure AI Vision service
- Understand capabilities of the Face service
- Compare and match detected faces
- Implement facial recognition

### Read Text in Images and Documents with the Azure AI Vision Service

Azure's Azure AI Vision service uses algorithms to process images and return information. This module teaches you how to use the Read API for optical character recognition (OCR).

#### Learning objectives

In this module, you'll learn how to:

- Read text from images with the Read API
- Use the Azure AI Vision service with SDKs and the REST API
- Develop an application that can read printed and handwritten text

### Extract data from forms with Azure Document Intelligence

Azure Document Intelligence uses machine learning technology to identify and extract key-value pairs and table data from form documents with accuracy, at scale. This module teaches you how to use the Azure Document Intelligence Azure AI service.

#### Learning objectives

In this module, you'll learn how to:

- Identify how Azure Document Intelligence's layout service, prebuilt models, and custom service can automate processes
- Use Azure Document Intelligence's Optical Character Recognition (OCR) capabilities with SDKs, REST API, and Azure Document Intelligence Studio
- Develop and test custom models

### Create an Azure Cognitive Search solution

Unlock the hidden insights in your data with Azure Cognitive Search.

#### Learning objectives

In this module you'll learn how to:

- Create an Azure Cognitive Search solution
- Develop a search application

### Create a custom skill for Azure Cognitive Search

Use the power of artificial intelligence to enrich your data and find new insights.

#### Learning objectives

In this module you will learn how to:

- Implement a custom skill for Azure Cognitive Search
- Integrate a custom skill into an Azure Cognitive Search skillset

### Create a knowledge store with Azure Cognitive Search

Persist the output from an Azure Cognitive Search enrichment pipeline for independent analysis or downstream processing.

#### Learning objectives

In this module you'll learn how to:

- Create a knowledge store from an Azure Cognitive Search pipeline
- View data in projections in a knowledge store