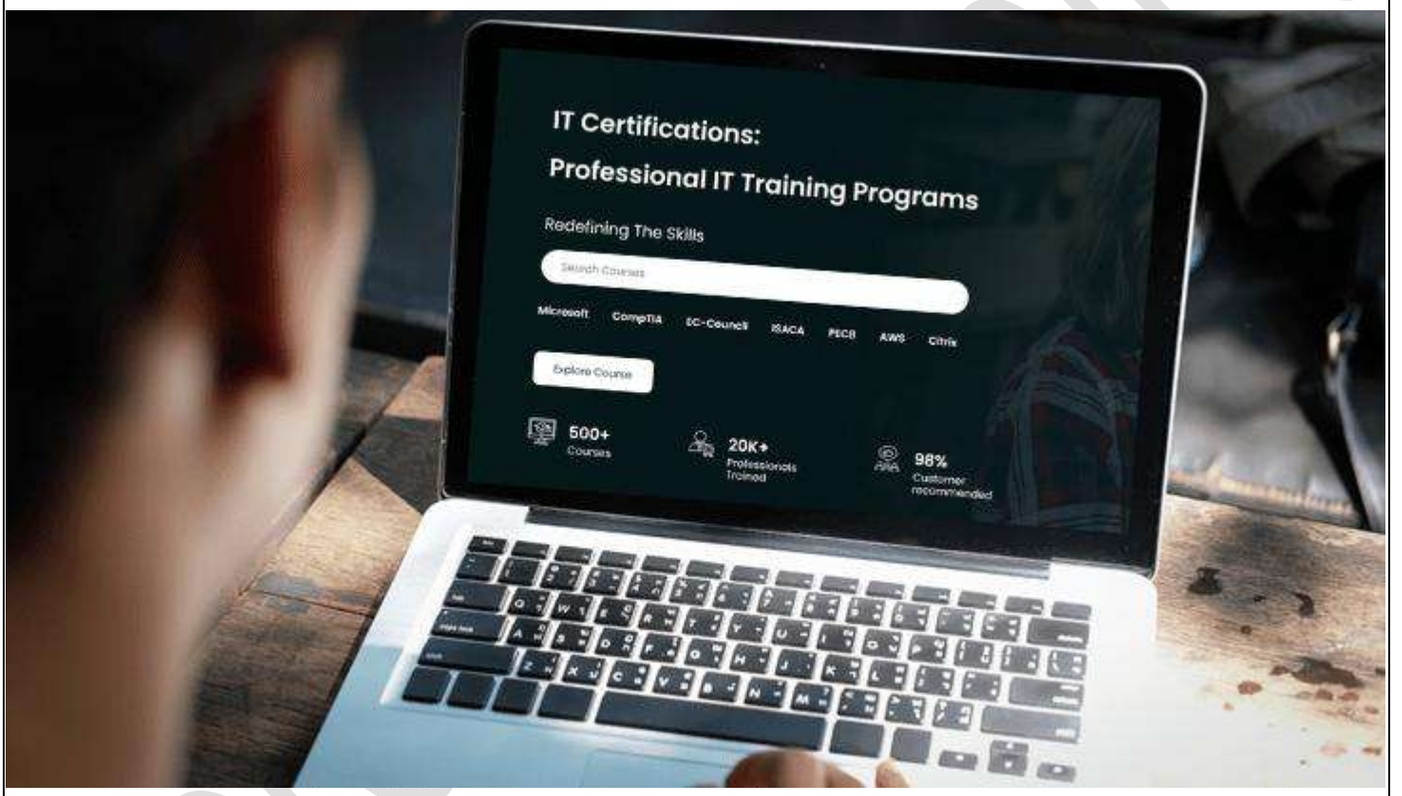
MICROTEK LEARNING | Redefining The Skills



AI-102: DESIGNING & IMPLEMENTING A MICROSOFT AZURE AI SOLUTION TRAINING

Duration: 4 Days

Course Description

AI-102: Designing & Implementing a Microsoft Azure AI Solution Training is a course built for professionals who are willing to leverage Azure AI Solutions and create an AI application that can be designed and implemented. This program describes the need for AI development in application.

After completion of this program, one can create, configure, secure, and deploy the Azure cognizant services. This course covers a broad range of concepts like the fundamentals of AI, computer vision, natural language processing, and conversational AI.

After successful completion of this program, one can establish themselves as an AI engineer.

This training is designed based on the objectives of the course variant AI-102T00-A.

Who should attend this course?

- Software engineer who is concerned with building, managing, and deploying AI solutions that leverage Azure Cognitive Services, Azure Cognitive Search, and Microsoft Bot Framework.
- Any professional who is familiar with C# or Python and has knowledge of using REST-based APIs to build computer vision, language analysis, knowledge mining, and conversational AI solutions on Azure.
- Given below are professionals who can use Designing & Implementing a Microsoft Azure AI Solution Training to upskill their current positions:
    - Technical Leads
    - Data Scientist
    - DevOps Engineers
    - AI and Machine Learning Engineers
    - Cloud Solutions Architects
    - Students

What you will learn

- 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

Prerequisites

Required:

- AI-900T00: Microsoft Azure AI Fundamentals Training

Recommended:

- DP-100T01: Designing and Implementing a Data Science Solution on Azure.
- AZ-900T00: Microsoft Azure Fundamentals
- AI-050T00: Develop Generative AI solutions with Azure OpenAI Service.
- Any professional pursuing this program needs familiarity with JSON and REST programming semantics.
- knowledge of either C#, Python, or JavaScript can be beneficial for this course.
- Familiarity with Microsoft Azure and ability to navigate the Azure portal is beneficial.

Curriculum

Module 1: Get started with Azure AI Services

- Prepare to develop AI solutions on Azure
  - 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 Azure OpenAI Service
  - Understand capabilities of Azure AI Search
- Create and consume Azure AI services
  - Create 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 and an SDK to consume Azure AI services.
- Secure Azure AI services
  - Consider authentication for Azure AI services
  - Manage network security for Azure AI services
- Monitor Azure AI services
  - Monitor Azure AI services costs.
  - Create alerts and view metrics for Azure AI services.
  - Manage Azure AI services diagnostic logging.
- Deploy Azure AI services in containers
  - Create containers for reuse
  - Deploy to a container and secure a container
  - Consume Azure AI services from a container

Module 2: Create computer vision solutions with Azure AI Vision

- Analyze images
  - Provision an Azure AI Vision resource
  - Analyze an image
  - Generate a smart-cropped thumbnail
- Image classification with custom Azure AI Vision models
  - Create a custom Azure AI Vision classification model
  - Understand image classification
  - Understand object detection
  - Train an image classifier in Vision Studio
- Detect, analyze, and recognize faces
  - Identify options for face detection, analysis, and identification.
  - Understand considerations for face analysis.

- Detect faces with the Computer 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
  - Read text from images using OCR
  - Use the Azure AI Vision service Image Analysis with SDKs and the REST API
  - Develop an application that can read printed and handwritten text
- Analyze video
  - Describe Azure Video Indexer capabilities
  - Extract custom insights
  - Use Azure Video Indexer widgets and APIs

Module 3: Develop natural language processing solutions with Azure AI Services

- Analyze text with Azure AI Language
  - Detect language from text
  - Analyze text sentiment
  - Extract key phrases, entities, and linked entities
- Create question answering solutions with Azure AI Language
  - Understand question answering and how it compares to language understanding.
  - Create, test, publish, and consume a knowledge base.
  - Implement multi-turn conversation and active learning.
  - Create a question answering bot to interact with using natural language.
- Build a conversational language understanding model
  - 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
- Create a custom text classification solution
  - Understand types of classification projects
  - Build a custom text classification project
  - Tag data, train, and deploy a model
  - Submit classification tasks from your own app
- Custom named entity recognition
  - Understand tagging entities in extraction projects
  - Understand how to build entity recognition projects
- Translate text with Azure AI Translator service
  - Provision a Translator resource
  - Understand language detection, translation, and transliteration
  - Specify translation options
  - Define custom translations
- Create speech-enabled apps with Azure AI services
  - 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
  - Provision Azure resources for speech translation.
  - Generate text translation from speech.
  - Synthesize spoken translations.

Module 4: Implement knowledge mining with Azure AI Search

- Create an Azure AI Search solution
  - Create an Azure AI Search solution
  - Develop a search application
- Create a custom skill for Azure AI Search
  - Implement a custom skill for Azure AI Search
  - Integrate a custom skill into an Azure AI Search skillset
- Create a knowledge store with Azure AI Search
  - Create a knowledge store from an Azure AI Search pipeline
  - View data in projections in a knowledge store
- Enrich your data with Azure AI Language
  - Use Azure AI Language to enrich Azure AI Search indexes.
  - Enrich an AI Search index with custom classes.
- Implement advanced search features in Azure AI Search
  - Improve the ranking of a document with term boosting
  - Improve the relevance of results by adding scoring profiles
  - Improve an index with analyzers and tokenized terms
  - Enhance an index to include multiple languages
  - Improve search experience by ordering results by distance from a given reference point
- Build an Azure Machine Learning custom skill for Azure AI Search
  - Understand how to use a custom Azure Machine Learning skillset.
  - Use Azure Machine Learning to enrich Azure AI Search indexes.
- Search data outside the Azure platform in Azure AI Search using Azure Data Factory
  - Use Azure Data Factory to copy data into an Azure AI Search Index
  - Use the Azure AI Search push API to add to an index from any external data source
- Maintain an Azure AI Search solution
  - Use Language Studio to enrich Azure AI Search indexes
  - Enrich an AI Search index with custom classes
- Perform search re-ranking with semantic ranking in Azure AI Search
  - Describe semantic ranking
  - Set up semantic ranking
  - Perform semantic ranking on an index
- Perform vector search and retrieval in Azure AI Search
  - Describe vector search
  - Describe embeddings
  - Run vector search queries using the REST API

Module 5: Develop solutions with Azure AI Document Intelligence

- Plan an Azure AI Document Intelligence solution
  - Describe the components of an Azure AI Document Intelligence solution.
  - Create and connect to Azure AI Document Intelligence resources in Azure.
  - Choose whether to use a prebuilt, custom, or composed model.
- Plan an Azure AI Document Intelligence solution
  - Describe the components of an Azure AI Document Intelligence solution.
  - Create and connect to Azure AI Document Intelligence resources in Azure.
  - Choose whether to use a prebuilt, custom, or composed model.
- Use prebuilt Document intelligence models
  - Identify business problems that you can solve by using prebuilt models in Forms Analyzer.
  - Analyze forms by using the General Document, Read, and Layout models.
  - Analyze forms by using financial, ID, and tax prebuilt models.

- Extract data from forms with Azure Document intelligence
    - Identify how Document intelligence's layout service, prebuilt models, and custom models can automate processes.
    - Use Document intelligence's capabilities with SDKs, REST API, and Document Intelligence Studio.
    - Develop and test custom models.
- Create a composed Document intelligence model
    - Describe business problems that you would use custom models and composed models to solve.
    - Train a custom model to obtain data from forms with unusual structures.
    - Create a composed model that can analyze forms in multiple formats.
- Build a Document intelligence custom skill for Azure AI search
    - Describe how a custom skill can enrich content passed through an Azure AI Search pipeline.
    - Build a custom skill that calls an Azure Forms Analyzer solution to obtain data from forms.

Module 6: Develop Generative AI solutions with Azure OpenAI Service

- Get started with Azure OpenAI Service
    - Create an Azure OpenAI Service resource and understand types of Azure OpenAI base models.
    - Use the Azure AI Studio, console, or REST API to deploy a base model and test it in the Studio's playgrounds.
    - Generate completions to prompts and begin to manage model parameters.
- Build natural language solutions with Azure OpenAI Service
    - Integrate Azure OpenAI into your application
    - Differentiate between different endpoints available to your application
    - Generate completions to prompts using the REST API and language specific SDKse
- Apply prompt engineering with Azure OpenAI Service
    - Understand the concept of prompt engineering and its role in optimizing Azure OpenAI models' performance.
    - Know how to design and optimize prompts to better utilize AI models.
    - Include clear instructions, request output composition, and use contextual content to improve the quality of the model's responses.
- Generate code with Azure OpenAI Service
    - Use natural language prompts to write code
    - Build unit tests and understand complex code with AI models
    - Generate comments and documentation for existing code
- Generate images with Azure OpenAI Service
    - Describe the capabilities of DALL-E in the Azure OpenAI service
    - Use the DALL-E playground in Azure AI Studio
    - Use the Azure OpenAI REST interface to integrate DALL-E image generation into your apps
- Implement Retrieval Augmented Generation (RAG) with Azure OpenAI Service
    - Describe the capabilities of Azure OpenAI on your data
    - Configure Azure OpenAI to use your own data
    - Use Azure OpenAI API to generate responses based on your own data
- Fundamentals of Responsible Generative AI
    - Describe an overall process for responsible generative AI solution development
    - Identify and prioritize potential harms relevant to a generative AI solution
    - Measure the presence of harms in a generative AI solution
    - Mitigate harms in a generative AI solution
    - Prepare to deploy and operate a generative AI solution responsibly

LAB Outline

- Lab Environment Setup
- Enable Resource Providers
- Get Started with Azure AI Services
- Manage Azure AI Services Security
- Monitor Azure AI Services
- Use an Azure AI Services Container
- Analyze Text
- Translate Text
- Recognize and Synthesize Speech
- Translate Speech
- Create a language understanding model with the Azure AI Language service
- Create a Conversational Language Understanding Client Application
- Create a Question Answering Solution
- Create a Bot with the Bot Framework SDK
- Create a Bot with Bot Framework Composer
- Analyze Images with Azure AI Vision
- Analyze Video with Video Analyzer
- Classify Images with Azure AI Custom Vision
- Detect Objects in Images with Custom Vision
- Detect and Analyze Faces
- Read Text in Images
- Extract Data from Forms
- Create an Azure AI Search solution
- Create a Custom Skill for Azure AI Search
- Create a Knowledge Store with Azure AI Search

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