Microsoft® Azure AI Fundamentals

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Course Description

This course prepares learners for the Microsoft Azure AI Fundamentals certificate. Throughout the course, learners will gain a solid understanding of cloud computing and artificial intelligence (AI) concepts. They will learn about the different types of machine learning (ML) and the advantages and disadvantages of AI and ML. In addition, learners will gain insights into the principles of responsible AI.

This course introduces learners to AI in Azure and the different services it offers, including cognitive services, bot services, and Azure Machine Learning. Learners will also learn about the common AI workloads in Azure, such as anomaly detection, computer vision, natural language processing (NLP), and knowledge mining. The course then details Azure Automated Machine Learning and Azure ML Designer, which enable learners to create machine learning models with ease.

Successful completion of the certification exam validates the knowledge and skill sets of individuals seeking employment or advancement in their careers.

Suggested Course Length: 45-70 Hours

Course Prerequisites

This course contains concepts related to using Microsoft Azure as a cloud platform and its products and services. For a more thorough introduction and reinforcement of concepts, you should have an account with Microsoft Azure. You can register for a free account at the Azure website on Microsoft's website and set up the type of subscription you want to use to pay for access to Azure.

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Unit 1: Cloud Computing and Artificial Intelligence

Unit Objectives

Lesson 1: Cloud Computing Fundamentals

Lesson Objectives
Main Computer Components
Computer Servers
Web Servers
Databases
Virtual Machines
Network
On-Premises Systems
Cloud Computing
Public Cloud
Private Cloud
Hybrid Cloud
Capital Expenditure vs Operational Expenditure
Consumption-Based Model
Shared Responsibility Model
Types of Cloud Services
Benefits of Cloud Computing
Lesson Summary
Practice Exercises
Practice Questions

Lesson 2: AI Fundamentals

Lesson Objectives
Artificial Intelligence Definition
History of Artificial Intelligence
Types of Artificial Intelligence
Machine Learning Definition
Types of Machine Learning
Advantages and Disadvantages of AI and ML
Data Science
Lesson Summary
Practice Exercises
Practice Questions

Lesson 3: AI in Azure

Lesson Objectives
Microsoft Azure AI
Natural Language Processing Services
Computer Vision Services
Speech and Bot Services
Anomaly Detection Services
Knowledge Mining Services
Machine Learning Services
Lesson Summary
Practice Exercise
Practice Questions
Unit Summary
Unit Assessment

Unit 2: Fundamentals of AI and Machine Learning

Unit Objectives

Lesson 1: Common AI Workloads

Lesson Objectives
Anomaly Detection
Anomaly Detection in Azure
Computer Vision
Computer Vision in Azure
Natural Language Processing
Natural Language Processing in Azure
Knowledge Mining
Knowledge Mining in Azure
Lesson Summary
Practice Exercise
Practice Questions

Lesson 2: Core ML Concepts

Lesson Objectives
Dataset
Supervised Learning
Unsupervised Learning
Reinforcement Learning
Deep Learning
Lesson Summary
Practice Exercise
Practice Questions

Lesson 3: Principles of Responsible AI

Lesson Objectives
Fairness
Reliability and Safety
Security and Privacy
Inclusiveness
Transparency
Accountability
Risks and Challenges in AI
Lesson Summary
Practice Exercise
Practice Questions
Unit Summary
Unit Assessment

Unit 3: Introduction to ML in Azure

Unit Objectives

Lesson 1: Data in ML

Lesson Objectives
Data Labeling
Feature Extraction
Training Datasets
Overfitting and Underfitting
Validation Datasets
Validation Metrics
Data Processing
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Lesson 2: Machine Learning Types1

Lesson Objectives
Regression
Regression Algorithms
Classification
Differences in Classification Algorithms
Clustering
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Lesson 3: Automated Machine Learning

Lesson Objectives
Azure Automated ML
MLOps
ML Pipelines
Azure ML Studio
Automated ML Job
Advanced Creation of a Job
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Lesson 4: Azure ML Studio

Lesson Objectives
Authoring
Azure ML Designer
Azure ML Designer Features
Assets
Manage ML Service
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Lesson 5: Azure ML Service

Lesson Objectives
Components
Regression with ML Azure Designer
Classification with ML Azure Designer
Clustering with ML Azure Designer
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Facial Detection, Recognition and Analysis0
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Azure Computer Vision Resources
Custom Vision Services
Custom Vision Image Classification
Custom Vision Object Detection
Face Services
Read API

Form Recognizer Service
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Practice Questions
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Unit Assessment

Unit 5: Natural Language Processing in Azure

Unit Objectives

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Lesson Objectives
Key Phrase Extraction
Entity Recognition
Sentiment Analysis
Speech Recognition and Synthesis
Translation
Language Modeling
Lesson Summary
Practice Exercise
Practice Questions

Lesson 2: Azure NLP Services
Lesson Objectives
Language Service
Speech Service
Translator Service
Lesson Summary
Practice Exercise
Practice Questions

Lesson 3: Azure Bot Service
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Language Understanding and Conversational AI
Bots Features
Bots Usage
QnA Maker
Bot Framework SDK
Bot Framework Composer
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Unit 6: Anomaly Detection and Knowledge Mining in Azure

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Lesson 1: Anomaly Detector
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Anomaly Detector Process
Anomaly Detector Usage
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Lesson 2: Knowledge Mining
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Azure Cognitive Search
Search Solution
Enrichment Pipeline
Indexes and Indexers
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Practice Questions

Lesson 3: Data Query and Storage
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Knowledge Storage
Data Query in Cognitive Search
Result Ranking
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Unit 7: Generative AI in Azure

Unit Objectives

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Generative AI
Discriminative AI vs Generative AI
Importance of Generative AI
Evolution of Deep Generative Models
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Lesson 2: Concepts of Generative AI
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Types of Generative AI Models
Challenges of Generative AI
Famous Generative AI Tools
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Lesson 3: Azure OpenAI Services
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Introduction to Azure OpenAI
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