

# 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.

## Unit 1: Cloud Computing and Artificial Intelligence

### Lesson 1: Cloud Computing Fundamentals

- 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 2: AI Fundamentals

- 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 3: AI in Azure

- Microsoft Azure AI
- Natural Language Processing Services
- Computer Vision Services
- Speech and Bot Services
- Anomaly Detection Services

- Knowledge Mining Services
- Machine Learning Services

## Unit 2: Fundamentals of AI and Machine Learning

### Lesson 1: Common AI Workloads

- 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 2: Core ML Concepts

- Dataset
- Supervised Learning
- Unsupervised Learning
- Reinforcement Learning
- Deep Learning

### Lesson 3: Principles of Responsible AI

- Fairness
- Reliability and Safety
- Inclusiveness
- Transparency
- Accountability
- Risks and Challenges in AI

## Unit 3: Introduction to ML in Azure

### Lesson 1: Data in ML

- Data Labeling
- Feature Extraction
- Training Datasets
- Overfitting and Underfitting
- Validation Datasets
- Validation Metrics
- Data Processing

### Lesson 2: Machine Learning Types

- Regression
- Regression Algorithms
- Classification
- Differences in Classification Algorithms
- Clustering

### Lesson 3: Automated Machine Learning

- Azure Automated ML
- MLOps
- ML Pipelines
- Azure ML Studio
- Automated ML Job
- Advanced Creation of a Job

### Lesson 4: Azure ML Studio

- Authoring
- Azure ML Designer
- Azure ML Designer
- Features
- Assets
- Manage ML Service

### Lesson 5: Azure ML Service

- Components
- Regression with ML Azure Designer
- Classification with ML Azure Designer
- Clustering with ML Azure Designer

## Unit 4: Computer Vision in Azure

### Lesson 1: Computer Vision Tasks

- Image Classification
- Object Detection
- Optical Character Recognition
- Facial Detection, Recognition and Analysis

### Lesson 2: Azure CV Services

- Computer Vision Service
- Azure Computer Vision Resources
- Custom Vision Services

- Custom Vision Image Classification
- Custom Vision Object Detection
- Face Services
- Read API
- Form Recognizer Service

## Unit 5: Natural Language Processing in Azure

### Lesson 1: NLP Tasks

- Key Phrase Extraction
- Entity Recognition
- Sentiment Analysis
- Speech Recognition and Synthesis
- Translation
- Language Modeling

### Lesson 2: Azure NLP Services

- Language Service
- Speech Service
- Translator Service

### Lesson 3: Azure Bot Service

- Language Understanding and Conversational AI
- Bots Features
- Bots Usage
- QnA Maker
- Bot Framework SDK
- Bot Framework
- Composer

## Unit 6: Anomaly Detection and Knowledge Mining in Azure

### Lesson 1: Anomaly Detector

- Anomaly Detector
- Definition
- Anomaly Detector Process
- Anomaly Detector Usage

### Lesson 2: Knowledge Mining

- Azure Cognitive Search
- Search Solution
- Enrichment Pipeline
- Indexes and Indexers

### Lesson 3: Data Query and Storage

- Knowledge Storage
- Data Query in Cognitive Search
- Result Ranking

## Unit 7: Generative AI in Azure

### Lesson 1: Introduction to Generative AI

- Generative AI

### Lesson 2: Concepts of Generative AI

- Working of Generative AI
- Types of Generative AI Models
- Challenges of Generative AI
- Famous Generative AI Tools

### Lesson 3: Azure OpenAI Services

- Azure OpenAI Service
- Benefits of Azure OpenAI Service
- Introduction to Azure OpenAI
- Playground in Azure OpenAI
- Deploy Models
- Azure OpenAI Service Models

### Appendices

- Courseware Mapping
- Glossary of Terms
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