

Developing Solutions for Microsoft Azure (AZ-203)

Course 22911 – 40 Hours

Overview

This course for developers covers the following topics you need to know about developing solutions for Microsoft Azure cloud platform:

- Develop Azure Infrastructure as a Service compute solution (AZ-203T01)
- Develop Azure Platform as a Service compute solution (AZ-203T02)
- Develop for Azure storage (AZ-203T03)
- Implement Azure security (AZ-203T04)
- Monitor, troubleshoot, and optimize Azure solutions (AZ-203T05)
- Connect to and consume Azure, and third-party, services (AZ-203T06)

Relevant Azure certification exam: AZ-203.

On Completion, Delegates will be able to

- Learn how to create and deploy virtual machines by using the Azure Portal, PowerShell, and through code.
- Learn how to create and deploy Azure Resource Manager templates by using the Azure Portal and Visual Studio.
- Understand the different encryption options and learn how to encrypt existing and new deployments.
- Understand how the Azure Batch service works
- Learn how to create and run batch jobs by using the Azure CLI
- Learn how to create and run batch jobs by using code
- Learn how to use the Azure Batch Service API to manage jobs
- Learn core concepts for Azure Kubernetes Service (AKS)
- Learn how to deploy AKS clusters
- Publish an image to the Azure Container Registry
- Learn about Azure Container Instances and how to deploy to them
- Understand App Service core concepts and capabilities
- Know how to create App Service web apps by using Azure CLI, Azure Portal, and PowerShell.
- Be able to create continuous and triggered WebJobs
- Push their app on to the Mobile App service
- How to register apps for push notifications
- Know how to create an APIM instance and create a new API
- Know how to use Swashbuckle to create Swagger objects in ASP.NET Core
- Understand the core features and functionality of Azure Functions
- Be able to create functions, bindings, and triggers
- Know common patters for Durable Functions and be able to create them

- Understand the features and uses of Azure Table storage
- Know how to utilize Shared Key authorization
- Know how to use the Azure Table storage REST service to manage data
- Understand core features and functionality of Azure Cosmos DB
- Be able to manage containers and items
- Be able to create and update documents
- Know how the Azure SQL Database service works
- Be able to perform database operations by using code
- Understand when and why to use Azure Blob storage
- Know how to set and retrieve Blob storage properties and metadata
- Know how to replicate and copy Blobs
- Understand the architecture of the Microsoft identity platform
- Be able to implement OAuth2 authentication in their solutions
- Be able to use Azure Key Vault to store and retrieve authentication information
- Learn how to use claims-based authorization in their development solutions
- How to manage access to resources using RBAC through the REST API
- Understand encryption options
- Learn how to encrypt data with Transparent Data Encryption
- Manage and utilize encryption keys by using the Azure key Vault
- Understand how Azure Monitor works
- Know where and how Azure Monitor collects data
- Understand autoscale patterns and best practices for scaling their solutions
- How to use the Azure CLI to communicate with a specific copy of a resource
- How to handle transient faults in your solution
- Know how to add default code to web pages, console apps, and Windows desktop apps to support telemetry
- Know how to use dashboards and other tools to monitor and troubleshoot their app
- Understand how Azure Cache for Redis operates and how to configure and interact with it
- Know how to manage Azure CDN
- Understand how to create and manage Azure Logic Apps.
- Know how to provision the service, create an index, load data, and execute searches.
- Know how to provision the APIM service using the Azure Portal, secure APIs with subscriptions and client certificates, and use API policies to modify the behavior of an API.
- Know how the services work and how to integrate them in to their solutions.
- Understand how to leverage Azure message-based services in their solutions.

Who Should Attend

- Students in this course are interested in Azure development or in passing the Microsoft Azure Developer Associate certification exam.
- Students should have 1-2 years of experience as a developer. This course assumes students know how to code and have a fundamental knowledge of Azure.
- It is recommended that students have some experience with PowerShell or Azure CLI, working in the Azure portal, and with at least one Azure-supported programming language. Most of the examples in this course are presented in C# .NET.

Prerequisites

- Students should have 1-2 years of experience as a developer. This course assumes students know how to code and have a fundamental knowledge of Azure.
- It is recommended that students have some experience with PowerShell or Azure CLI, working in the Azure portal, and with at least one Azure-supported programming language. Most of the examples in this course are presented in C# .NET.

Course Contents

Day 1 - Develop Azure Infrastructure as a Service compute solutions (AZ-203T01)

In this course students will gain the knowledge and skills needed to implement Azure IaaS services and features in their development solutions. The course covers provisioning virtual machines, using Batch Service to deploy/maintain resources, and how to create containerized solutions by using Azure Kubernetes Service.

Day 1 Contents:

Module 1: Implement solutions that use virtual machines

Students will learn how to properly plan for VM deployment. It covers VM creation by using the Azure Portal, PowerShell, and through code. It also covers creating and using ARM templates for repeatable deployments and how to use Azure Disk Encryption to secure information on the VM.

- Provision VMs
- Create ARM templates
- Configure Azure Disk Encryption for VMs

Module 2: Implement batch jobs by using Azure Batch Services

Azure Batch creates and manages a pool of compute nodes (virtual machines), installs the applications you want to run, and schedules jobs to run on the nodes.

- Azure Batch overview
- Run a batch job by using the Azure CLI and Azure Portal
- Run batch jobs by using code
- Manage batch jobs by using the Batch Service API

Module 3: Create containerized solutions

You can build and run modern, portable, microservices-based applications that benefit from Kubernetes orchestrating and managing the availability of those application components. Kubernetes supports both stateless and stateful applications as teams progress through the adoption of microservices-based applications.

- Create an Azure Managed Kubernetes Service (AKS) cluster
- Create container images for solutions
- Publish an image to the Azure Container Registry
- Run containers by using Azure Container Instance or AKS

Day 2 - Develop Azure Platform as a Service compute solutions (AZ-203T02)

In this course will gain the knowledge and skills needed to implement Azure Platform as a Service feature and services in their development solutions. Students will learn how to create and manage Azure App Service resources, integrate push and offline sync in their mobile apps, and how to document an API. Students will also learn how to create and test Azure Functions.

Day 2 Contents:

Module 1: Create App Service web apps

Azure App Service Web Apps (or just Web Apps) is a service for hosting web applications, REST APIs, and mobile back ends. Web Apps not only adds the power of Microsoft Azure to your application, such as security, load balancing, autoscaling, and automated management.

- Azure App Service core concepts
- Creating an Azure App Service web app
- Creating background tasks by using WebJobs in Azure App Service

Module 2: Creating Azure App Service mobile apps

The Mobile Apps feature of Azure App Service gives enterprise developers and system integrators a mobile-application development platform that's highly scalable and globally available.

- Getting started with mobile apps in App Service
- Enable push notifications for your app
- Enable offline sync for your app

Module 3: Create Azure App Service API apps

This module covers how to create and document an Azure App Service API.

- Creating APIs
- Using Swagger to document an API

Module 4: Implement Azure Functions

Azure Functions is a solution for easily running small pieces of code, or "functions," in the cloud. You can write just the code you need for the problem at hand, without worrying about a whole application or the infrastructure to run it.

- Azure Functions overview
- Develop Azure Functions using Visual Studio
- Implement durable functions

Day 3 - Develop for Azure storage (AZ-203T03)

In this course students will gain the knowledge and skills needed to leverage Azure storage services and features in their development solutions. It covers Azure Table storage, Azure Cosmos DB, Azure Blob, and developing against relational databases in Azure.

Day 3 Contents

Module 1: Develop solutions that use Azure Table storage

Azure Table storage is a service that stores structured NoSQL data in the cloud, providing a key/attribute store with a schemaless design. Because Table storage is schemaless, it's easy to adapt your data as the needs of your application evolve.

- Azure Table storage overview
- Authorization in Table storage
- Table service REST API

Module 2: Develop solutions that use Azure Cosmos DB storage

This module covers Azure Cosmos DB storage. It instructs students on how it works, how to manage containers and items, and create and update documents by using code.

- Azure Cosmos DB overview
- Managing containers and items
- Create and update documents by using code

Module 3: Develop solutions that use a relational database

SQL Database is a general-purpose relational database managed service in Microsoft Azure that supports structures such as relational data, JSON, spatial, and XML.

- Azure SQL overview
- Create, read, update, and delete database tables by using code

Module 4: Develop solutions that use Microsoft Azure Blob storage

Azure Blob storage is Microsoft's object storage solution for the cloud. Blob storage is optimized for storing massive amounts of unstructured data. Unstructured data is data that does not adhere to a particular data model or definition, such as text or binary data.

- Azure Blob storage overview
- Working with Azure Blob storage

Day 4 - Implement Azure security (AZ-203T04)

In this course students will gain the knowledge and skills needed to include Azure authentication and authorization services in their development solutions. Students will learn how identity is managed and utilized in Azure solutions by using the Microsoft identity platform. Students will also learn about access control (claims-based authorization and role-based access control) and how to implement secure data solutions. Throughout the course students learn how to create and integrate these resources by using the Azure CLI, REST, and application code.

Day 4 Contents

Module 1: Implement authentication

Microsoft identity platform is an evolution of the Azure Active Directory (Azure AD) identity service and developer platform. It allows developers to build applications that sign in all Microsoft identities, get tokens to call Microsoft Graph, other Microsoft APIs, or APIs that developers have built.

- Microsoft identity platform
- Implement OAuth2 authentication
- Implement managed identities for Azure resources
- Implement authentication by using certificates, forms-based authentication, or tokens
- Implement multi-factor authentication

Module 2: Implement access control

This module covers claims-based and role-based access control.

- Claims-based authorization
- Role-based access control (RBAC) authorization

Module 3: Implement secure data solutions

This module covers securing data at rest and during transmission.

- Encryption options
- End-to-end encryption
- Implement Azure confidential computing
- Manage cryptographic keys in Azure Key Vault

Day 5 - Monitor, troubleshoot, and optimize Azure solutions (AZ-203T05)

In this course students will gain the knowledge and skills needed to ensure applications hosted in Azure are operating efficiently and as intended. Students will learn how Azure Monitor operates and how to use tools like Log Analytics and Application Insights to better understand what is happening in their application. Students will also learn how to implement autoscale, instrument their solutions to support monitoring and logging, and use Azure Cache and CDN options to enhance the end-user experience.

Day 5 Contents

Module 1: Introduction to Azure Monitor

Azure Monitor is the central service that includes all of tools you need to monitor and optimize your solution.

- Overview of Azure Monitor

Module 2: Develop code to support scalability of apps and services

This module covers how applications scale and how to handle some troubleshooting.

- Implement autoscale
- Implement code that addresses singleton application instances
- Implement code that handles transient faults

Module 3: Instrument solutions to support monitoring and logging

This module covers adding code to your app to send the data to Azure Monitor.

- Configure instrumentation in an app or server by using Application Insights
- Analyze and troubleshoot solutions by using Azure Monitor

Module 4: Integrate caching and content delivery within solutions

This module shows students how to leverage Azure Cache for Redis and Azure CDNs to deliver assets to users more quickly.

- Azure Cache for Redis
- Develop for storage on CDNs

Day 6 - Connect to and consume Azure, and third-party, services (AZ-203T06)

This course is all about communication between apps and services. Students will learn how to create and manage their own APIs by using API Management, and how to use the different event- and message-based services in Azure within their development solutions. Throughout the course students learn how to create and integrate these resources by using the Azure Portal, Azure CLI, REST, and application code.

Day 6 Contents:

Module 1: Develop an App Service Logic App

Logic Apps helps you build solutions that integrate apps, data, systems, and services across enterprises or organizations by automating tasks and business processes as workflows. This module covers what they are and how to create them.

- Azure Logic Apps overview
- Create Logic Apps by using Visual Studio
- Create custom connectors for Logic Apps
- Create custom templates for Logic Apps

Module 2: Integrate Azure Search within solutions

Azure Search is a search-as-a-service cloud solution that gives developers APIs and tools for adding a rich search experience over private, heterogeneous content in web, mobile, and enterprise applications. In this module students will learn how to integrate Azure Search in to their solutions.

- Create and query an Azure Search Index
- Full text search in Azure Search

Module 3: API Management

API Management (APIM) helps organizations publish APIs to external, partner, and internal developers to unlock the potential of their data and services.

- Introduction to the API Management service
- Securing your APIs
- Defining API policies

Module 4: Develop event-based solutions

This module covers developing event-based solutions in Azure by integrating Azure Event Grid, Event Hubs, and Notification Hubs in your applications.

- Implement solutions that use Azure Event Grid
- Implement solutions that use Azure Event Hubs
- Implement solutions that use Azure Notification Hubs

Module 5: Develop message-based solutions

Microsoft Azure Service Bus is a fully managed enterprise integration message broker. Service Bus is most commonly used to decouple applications and services from each other, and is a reliable and secure platform for asynchronous data and state transfer. Azure Queue storage is a service for storing large numbers of messages that can be accessed from anywhere in the world via authenticated calls using HTTP or HTTPS.

- Implement solutions that use Azure Service Bus
- Implement solutions that use Azure Queue Storage queues