

## AZ-203 Course outline

### **AZ-203T01: Develop Azure Infrastructure as a Service compute solutions**

#### **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 Azure Resource Manager (ARM) templates for repeatable deployments and how to use Azure Disk Encryption to secure information on the VM.

##### **Lessons**

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

After completing this module, students 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 ARM by using the Azure Portal and Visual Studio.
- Understand the different encryption options and learn how to encrypt existing and new deployments.

#### **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.

##### **Lessons**

- 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

After completing this module, students will be able to:

- 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

## **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.

### **Lessons**

- 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

After completing this module, students will be able to:

- Learn core concepts for 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

## **AZ-203T02: Develop Azure Platform as a Service compute solutions**

### **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 adds the power of Microsoft Azure to your application, via security, load balancing, autoscaling, and automated management.

### **Lessons**

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

After completing this module, students will be able to:

- Understand App Service core concepts and capabilities
- Create App Service web apps by using Azure CLI, Azure Portal, and PowerShell
- Create continuous and triggered WebJobs

## **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.

### **Lessons**

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

After completing this module, students will be able to:

- Push their app on to the Mobile App service
- Register apps for push notifications

## **Module 3: Create Azure App Service API apps**

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

### **Lessons**

- Creating APIs
- Using Swagger to document an API

After completing this module, students will be able to:

- Create an APIM instance and create a new API
- Use Swashbuckle to create Swagger objects in ASP.NET Core

## **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.

### **Lessons**

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

After completing this module, students will be able to:

- Understand the core features and functionality of Azure Functions
- Create functions, bindings, and triggers
- Know common patterns for Durable Functions and be able to create them

## **AZ-203T03: Develop for Azure storage**

### **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.

### **Lessons**

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

After completing this module, students will be able to:

- 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

### **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.

### Lessons

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

After completing this module, students will be able to:

- Understand core features and functionality of Azure Cosmos DB
- Manage containers and items
- Create and update documents

## 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.

### Lessons

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

After completing this module, students will be able to:

- Know how the Azure SQL Database service works
- Perform database operations 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.

### Lessons

- Azure Blob storage overview
- Working with Azure Blob storage

After completing this module, students will be able to:

- Understand when and why to use Azure Blob storage
- Set and retrieve Blob storage properties and metadata
- Replicate and copy Blobs

## **AZ-203T04: Implement Azure security**

### **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.

#### **Lessons**

- 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

After completing this module, students will be able to:

- Understand the architecture of the Microsoft identity platform
- Implement OAuth2 authentication in their solutions
- Use Azure Key Vault to store and retrieve authentication information

### **Module 2: Implement access control**

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

#### **Lessons**

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

After completing this module, students will be able to:

- Use claims-based authorization in their development solutions
- Manage access to resources using RBAC through the REST API

### **Module 3: Implement secure data solutions**

This module covers securing data at rest and during transmission.

#### **Lessons**

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

After completing this module, students will be able to:

- Understand encryption options
- Encrypt data with Transparent Data Encryption
- Manage and utilize encryption keys by using the Azure key Vault

### **AZ-203T05: Monitor, troubleshoot, and optimize Azure solutions**

#### **Module 1: Introduction to Azure Monitor**

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

#### **Lessons**

- Overview of Azure Monitor

After completing this module, students will be able to:

- Understand how Azure Monitor works
- Know where and how Azure Monitor collects data

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

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

### Lessons

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

After completing this module, students will be able to:

- Understand autoscale patterns and best practices for scaling their solutions
- Use the Azure CLI to communicate with a specific copy of a resource
- Handle transient faults in your solution

## Module 3: Instrument solutions to support monitoring and logging

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

### Lessons

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

After completing this module, students will be able to:

- Add default code to web pages, console apps, and Windows desktop apps to support telemetry
- Use dashboards and other tools to monitor and troubleshoot their app

## 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.

### Lessons

- Azure Cache for Redis
- Develop for storage on CDNs

After completing this module, students will be able to:



- Understand how Azure Cache for Redis operates and how to configure and interact with it
- Manage Azure CDN

## **AZ-203T06: Connect to and consume Azure and third-party services**

### **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.

#### **Lessons**

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

After completing this module, students will be able to:

- Understand how to create and manage Azure 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, heterogenous content in web, mobile, and enterprise applications. In this module students will learn how to integrate Azure Search in to their solutions.

#### **Lessons**

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

After completing this module, students will be able to:

- Provision the service, create an index, load data, and execute searches

## 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.

### Lessons

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

After completing this module, students will be able 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

## 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.

### Lessons

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

After completing this module, students will:

- Know how the services work and how to integrate them in to their solutions

## 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.

## Lessons

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

After completing this module, students will:

- Understand how to leverage Azure message-based services in their solutions