

## Course 20532B: Developing Microsoft Azure Solutions

**Five Days, Instructor-Led**

### About this Course

This course is intended for students who have experience building vertically scaled applications. Students should also have experience with the Microsoft Azure platform and a basic understanding of the services offered in Azure.

This course offers students the opportunity to take an existing web application and expand its functionality as part of moving it to Azure. The course does not require any existing experience with the ASP.NET platform. This course focuses on the architectural considerations and decisions necessary when building a highly available solution in the cloud. This course also prepares the students for the 70-532: Developing Microsoft Azure Solutions certification exam.

### Audience profile

The candidates targeted by this training have basic experience in implementing and monitoring Microsoft Azure solutions. Candidates are also proficient with the development tools, techniques and approaches used to build application solutions.

### At Course Completion

After completing this course, students will be able to:

- review the services available in the Azure platform and the Management Portals used to manage the service instances.
- create a Virtual Machine using the Azure Management Portal and create an image of the VM.
- create an Azure Web Site and publish an existing ASP.NET web application to the site.
- create an Azure SQL server and database.
- describe and identify the common practices and patterns for building resilient and scalable web applications that will be hosted in Azure.
- create an Azure Cloud Service project in Visual Studio 2013 and debug locally.
- create a background process using a Azure Worker Role.
- create an Azure Table Storage table and manage the table data using the .NET API for Azure Storage.
- create Azure Files SMB file share and store documents.
- create an Azure Storage Queue instance to store requests.
- create an Azure Service Bus queue instance to store requests.
- create an Azure Service Bus namespace and use the namespace to connect a cloud web application to the local WCF service.
- create a Virtual Machine using the existing SQL template and connect this Virtual Machine to the existing application.
- create a test environment using PowerShell and the Azure Service Management CmdLets.
- integrate ASP.NET Identity for the administration portal with Azure Active Directory.
- deploy the web application projects to Azure.

## Pre-requisites

Before attending this course, students must be able to:

- Compare the services available in the Azure platform.
- Configure and deploy web applications.
- Create Azure WebSites using the gallery.
- Deploying and monitoring Azure WebSites.
- Create and configure Azure Virtual Machines.
- Describe the relationship between Cloud Services and Virtual Machines.
- Deploy existing Cloud Service packages.
- Create and manage a Storage account.
- Manage blobs and containers in a Storage account.
- Create, configure and connect to a SQL Databases instance.
- Identify the implications of importing a SQL Standalone database.
- Manage users, groups and subscriptions in an Azure Active Directory instance.
- Create a virtual network.
- Implement a point to site network.

## Course Outline

### Module 1: Processing Background Logic using Azure

In this module, students will learn how to use Cloud Service Worker Roles and Web Sites Web Jobs to process data in the background. Students will also be able to use Cloud Service Cache Roles to store data in the cache.

#### Lessons

- Understanding Cloud Services
- Cloud Service Web Roles
- Customizing Cloud Service Configurations
- Updating and Managing Azure Cloud Service Deployments
- Cloud Service Worker Roles
- Cloud Service Worker Role Processing
- Caching Data using Roles
- Analyzing Applications in Cloud Service Role Instances

#### Lab : Creating a Background Process Using Azure Worker Roles

- Create a C# Class Library

- Add the Class Library to a Cloud Service Project
- Debug Worker Roles in a Cloud Service Project

After completing this module, you will be able to:

- Describe the Azure Cloud Service offering.
- Explain the complexity of Cloud Service deployments as compared to Virtual Machines and Web Sites.
- Describe the differences between Web Roles and Worker Roles.
- Describe Cloud Service In-Role Caching.
- Leverage the Azure Compute Emulator.
- Create a Cloud Service Worker Role.
- Implement the methods for the RoleEntryPoint base class.
- Configure a Worker Role.
- Co-locate cache with a Cloud Service role.
- Convert a Worker Role to a dedicated cache role.

## Module 2: Storing Tabular Data in Azure

In this module, students will be able to use Azure SQL Databases to store and retrieve data. Students will also learn how to store data in Azure Table Storage.

### Lessons

- Azure SQL Databases Overview
- Managing SQL Databases in Azure
- Using Azure SQL Databases with SQL Server Data Tools
- Migrating Data to Azure SQL Databases
- Replication and Recovery of Azure SQL Database Instances
- Azure Storage Overview
- Azure Storage Tables Overview
- Table Entity Transactions

### Lab : Storing Event Data in Azure SQL Databases

- Creating an Azure SQL Instance
- Using Entity Framework with Azure SQL
- Populating the Sign-In Form with Registrant Names
- Updating the Events Website to use Storage Tables
- Verify that the Events Web Site is using Azure Storage Tables for Registrations

### Lab : Storing Event Registration Data in Azure Storage Tables

- Creating an Azure SQL Instance
- Using Entity Framework with Azure SQL
- Populating the Sign-In Form with Registrant Names
- Updating the Events Website to use Storage Tables
- Verify that the Events Web Site is using Azure Storage Tables for Registrations

After completing this module, students will be able to:

- Describe the difference between Azure SQL Database Editions
- Explain some of the advantages and disadvantages of hosting databases in Azure SQL Databases.
- Explain some of the advantages and disadvantages of hosting databases in a SQL Server installation on an Azure Virtual Machine.
- Describe the tools that can be used to manage Azure SQL Databases.
- Describe the Visual Studio 2013 features that can be used to manage Azure SQL Databases.
- Explain options for migrating data from on premise to the cloud.
- Describe strategies for using Entity Framework with Azure SQL Databases.

## Module 3: Storing Files and Media in Azure

In this module, students will learn how to store and access multimedia files in Azure using Blob Storage.

### Lessons

- Azure Storage Blobs
- Controlling Access to Storage Blobs & Containers
- Monitoring Storage Blobs
- Configuring Azure Storage Accounts
- Azure Files
- Uploading and Migrating Storage Data

### Lab : Storing Generated Documents in Azure Storage Blobs

- Implement Azure Storage Blobs
- Populating the Container with Files and Media
- Retrieving Files and Media From the Container

- Specifying Permissions for the Container

After completing this module, students will be able to:

- Describe the Blob services in Azure Storage.
- Detail the SDK libraries, namespaces and classes available for blobs.

#### **Module 4: Development using the Microsoft Azure Platform**

In this module, students will review the services available in the Azure platform and the Management Portals used to manage the service instances.

##### **Lessons**

- Azure Services
- Management Portals

After completing this module, you will be able to:

- Describe some of the common Azure services
- Describe the differences between the current and Ibiza management portals

#### **Module 5: Establishing a Development Environment using Azure Virtual Machines**

In this module, students will learn about Virtual Machine hosting options available in Azure. Students will be able to deploy custom workloads to an Azure Virtual Machine, manage the VM and its images and also monitor VMs.

##### **Lessons**

- Constructing Azure Virtual Machines
- Azure Virtual Machine Workloads
- Migrating Azure Virtual Machine Instances

##### **Lab : Creating an Azure Virtual Machine for Development & Testing**

- Create a Logical Network using Azure

- Create a Development Virtual Machine using Azure

- Configure the Virtual Machine for Development

- Create an Image from the Virtual Machine

After completing this module, you will be able to:

- Describe Virtual Machines service in Azure.

- Deploy a Linux or Microsoft workload to a Virtual Machine

- Ingress VHDs to Azure

- Monitor Virtual Machine endpoints

#### **Module 6: Managing Infrastructure in Azure**

In this module, students will explore the Infrastructure components in Azure. Students will be able to describe Virtual Networks and understand the relationship between the VNETs and the different services offered in Azure. Students will also be able to add Cloud Services and Virtual Machines to VNETs. Finally students will scale multiple instances of services in a VNET.

##### **Lessons**

- Azure Virtual Networks
- Highly Available Azure Virtual Machines
- Virtual Machine Configuration Management

- Customizing Azure Virtual Machine Networking

##### **Lab : Managing Multiple Virtual Machines in a Virtual Network**

- Create the Database Virtual Machine
- Create the Application Virtual Machines
- Connect the Test Application to the SQL Server Virtual Machine

- Modify the Application Virtual Machine into a Web Server

After completing this module, students will be able to:

- Create a Virtual Network.
- Describe the options for allowing anonymous and private access to a VM and its port.
- Customize the networking rules for a VM.

### **Module 7: Web Infrastructure in the Azure Platform**

In this module, students will learn how to create and host a simple website using Azure Web Sites. Students will also learn how to monitor and manage the website using the Management Portal.

#### **Lessons**

- Azure Web Sites
- Hosting Web Applications in Azure
- Configuring an Azure Web Site
- Publishing an Azure Web Site
- Monitoring an Azure Web Site

#### **Lab : Creating an ASP.NET Web Site Using Azure Web Sites**

- Create an Azure Web Site
- Deploy an ASP.NET Web Application to a Azure Web Site
- Configure an Azure Web Site

After completing this module, you will be able to:

- Create an Azure Web Sites instance
- Publish a simple ASP.NET web application to Azure Web Sites
- Monitor an Azure Web Site

### **Module 8: Designing Cloud Applications for Resiliency**

This module covers the common practices and patterns for building resilient and scalable web applications that will be hosted in Azure.

#### **Lessons**

- Application Design Practices for Highly Available Applications
- Building High Performance Applications using ASP.NET
- Common Cloud Application Patterns
- Caching Application Data

After completing this module, students will be able to:

- Describe the design practices for creating highly available applications.
- Create high performance applications using ASP.NET.
- Describe the common cloud application patterns.
- Describe how to use analytics on cloud applications.

### **Module 9: Storing Data in Queues using Azure**

In this module, students will use Azure Queue Storage to queue data for asynchronous processing. Students will also be able to identify the Service Bus offerings and identify which ones to use in appropriate scenarios. Students will be able to use the Azure Service Bus Relay to connect on-premise services with client applications.

#### **Lessons**

- Queue Mechanisms in Azure
- Azure Storage Queues Overview
- Handling Storage Queue Messages
- Azure Service Bus
- Azure Service Bus Queues
- Azure Service Bus Relay
- Azure Service Bus Notification Hubs

#### **Lab : Using Queues and Service Bus to Manage Communication Between Web Applications in Azure**

- Create an Azure Service Bus Namespace
- Use Azure Queue Storage For Document Generation

- Use Service Bus Queues for Document Generation
- Use Service Bus Relay to Connect a WCF Service and Client[s]

After completing this module, students will be able to:

- Describe Azure Storage Queues.
- Describe Azure Service Bus.
- Describe Azure Service Bus Queues.

### **Module 10: Automating Integration with Azure Resources**

In this module, students will explore the options for automating their interactions with Azure Resources.

#### **Lessons**

- Azure SDK Client Libraries
- Scripting Azure Service Management using PowerShell
- Azure REST Interface
- Azure Resource Manager

#### **Lab : Automating the Creation of a Test Environment using PowerShell**

- Prepare Azure PowerShell Environment
- Use PowerShell to Create and Access a Website
- Use a Resource Template to Create Multiple Pre-Configured Resources

After completing this module, students will be able to:

- Describe the Azure SDKs and client libraries.
- Use PowerShell to automate Azure service management.
- Describe the Service Management API and how to authenticate to the API.
- Use the Resource Manager to create resource groups and templates.

### **Module 11: Implementing Security in Web Applications using Azure**

In this module, students will be able to use Azure Active Directory to implement security in a Cloud web application.

#### **Lessons**

- Azure Active Directory
- Azure AD Directories
- Azure AD Access Control Service
- Azure AD Multi-Factor Authentication

#### **Lab : Integrating Azure Active Director with the Events Administration Portal**

- Create an Azure AD Directory
- Secure an Existing ASP.NET Web Application
- Integrate Azure AD with ASP.NET Identity

After completing this module, students will be able to:

- Describe the Azure Active Directory service offering.
- Detail the features available for directories in Azure AD.
- Describe the Azure AD Access Control Service.
- Describe the Azure AD Multi-Factor Authentication service.

### **Module 12: Deploying Web Applications to Azure**

In this module, students will be able to deploy web applications to Azure by using WebDeploy and Service Packages.

#### **Lessons**

- Deployment Strategies for Web Applications
- Deploying Azure Web Sites
- Deploying Azure Cloud Services
- Continuous Integration

- Monitoring Cloud Applications

**Lab : Deploying the Events Web Application to Azure**

- Create the Target Azure Services for Deployment
- Manage Configuration Settings for a Cloud Web Application
- Deploy the Web Applications to Azure
- Monitor the Web Applications in Azure

After completing this module, students will be able

to:

**Course Inclusions:**

- Microsoft Official Curriculum (MOC) and/or Wizards Learning Courseware (WLC)
- Microsoft Certified Trainer (MCT)
- Lunch, AM and PM Snacks
- Certificate of Achievement
- Course Note

- List the deployment strategies for web applications.
- Describe Cloud Service package deployment for Azure Cloud Services.
- Describe WebDeploy deployment for Azure Web Sites.
- Describe the options for monitoring a web application in Azure.