



Microsoft Azure with DevOps

- ✓ **Cloud Computing Introduction**
 - Introduction to Cloud Computing
 - Cloud Characteristics
 - Cloud Computing Service Models
 - Deployment Models in Cloud Computing
 - Advantages and Disadvantages of Cloud Computing
 - Different Azure Certifications.

- ✓ **Getting Starting with Azure**
 - Introduction to Azure
 - Azure Hosting Models
 - Different Azure Services (IaaS, PaaS, SaaS)
 - Azure Subscriptions
 - Understanding Azure Portal
 - Azure Key Concepts
 - Azure Resource Group

- ✓ **Understanding Azure Virtual Networks**
 - Overview of Azure Networking
 - Understanding Virtual Network and its Benefits
 - Understanding Network Resources
 - Implement and manage virtual networking
- ✓ Create a VNet using Azure Portal
- ✓ Create a Subnet
- ✓ Configure private and public IP addresses
- ✓ Create Network Interface Card with public, and private IP addresses
- ✓ Create a Virtual Machine

- ✓ Setup Network Security Group
- ✓ Create security rules
- ✓ Associate NSG to a subnet or network interface
- ✓ Understanding Inbound & Outbound Rules
- ✓ Evaluate effective security rules
 - Azure Firewall
 - Understanding Azure DNS
- ✓ Configure Azure DNS
- ✓ Public and Private DNS Zones
 - Create connectivity between virtual networks
- ✓ Create and configure VNET peering
- ✓ Create and configure VNET to VNET
- ✓ Verify virtual network connectivity
 - Monitoring and Troubleshooting Network Connectivity

- ✓ **Advanced Virtual Networking**
 - Load Balancing
- ✓ Configure external and internal Azure Load balancer
- ✓ Load Balancing Rules
- ✓ Implement front end IP configuration
 - Understanding and Creating Availability Set
 - Understanding Availability Zones
 - Azure Application Gateway
 - Azure Traffic Manager
 - Integrate on-premises network with Azure virtual network
- ✓ Site-to-Site VPN
- ✓ Express Route Solution
 - Monitor and Manage Networking
- ✓ Verify, Manage and Monitor on-premises connectivity;
- ✓ Use network resource monitoring and Network Watcher
- ✓ Manage external networking and virtual network connectivity

- ✓ **Azure Storage Service**
 - About Storage Service and Account

- Creating a Storage Account
 - Working with Blob Storage
- ✓ Types of Blobs (Block, Append, Page)
- ✓ Container and Metadata
- ✓ Soft Copy
- ✓ Azure Storage Explorer
- ✓ Transfer Data using AzCopy
- ✓ Programming Blob Storage
- ✓ Async Blob Copy
- ✓ Import and Export Service
- ✓ Implement and Configure CDN
- ✓ Configure Custom Domain
- ✓ Scale Blob Storage
- ✓ Storage Service Encryption
 - Manage Access / Securing Storage
- ✓ Create and Manage Shared Access Signature
- ✓ Account SAS vs Service SAS
- ✓ Using Stored Access Policies
- ✓ Regenerating Keys
- ✓ Encrypt Keys using Azure Key Vault integration
- ✓ Programming in C#
 - Working with Table Storage
- ✓ Understanding NoSQL Database
- ✓ Creating Table and Entities using Storage Explorer
- ✓ Entities and Properties
- ✓ Table storage vs COSMOS DB Table API
- ✓ Programming Table Storage
 - Azure Queues Storage
- ✓ Understanding Async Communication using Queues
- ✓ Comparing Azure Queues and Service Bus Queues
- ✓ Programming Queues
 - Azure SMB File Storage
- ✓ Common usage of File Storage
- ✓ Shares, Directory and File
- ✓ Managing Using Azure Portal
- ✓ Programming File Storage
 - Azure File Sync

- Configure diagnostics, monitoring and analytics
- ✓ Capturing Metrics Data
- ✓ Analyzing Diagnostic Data
- ✓ Capturing Logs
- ✓ Retention Policies and Logging Levels
- ✓ Analyze Logs
- ✓ Enabling Monitoring
- ✓ Enabling Alerts

- ✓ **Resource groups**
 - Use Azure policies for resource groups
 - Configure resource locks
 - Configure resource policies
 - Implement and set tagging on resource groups
 - Move resources across resource groups
 - Remove resource groups

- ✓ **Azure with Windows PowerShell and Azure CLI.**
 - Installing the required modules
 - Login to Azure Portal
 - Managing Resource Group
 - Managing App Service Plans and App Service Web Apps
 - Create and Configure a Storage Account
 - Managing Storage Accounts using PowerShell
 - Azure CLI Introduction and Setup
 - Creating Resources
 - Listing and Formatting output
 - Connect a Web App to SQL Database
 - Deleting Resources
 - Interactive Mode

- ✓ **ARM Templates**

- Understanding Azure Resource Manager (ARM)
- Exporting and Importing ARM templates.
- ARM Resource Providers
- Deploy ARM Templates
- ✓ Using PowerShell
- ✓ Azure CLI
- ✓ Azure Portal
 - Incremental and Complete Deployments

- ✓ **Azure Virtual Machine**
 - Introduction
 - About Virtual Machine Workloads
 - Create a Windows Virtual Machine using Portal / PowerShell / ARM Templates
 - Deploy popular application frameworks by using Azure Resource Manager templates
 - Virtual Machine Disk
 - Convert Unmanaged Disk to Managed Disk
 - Generalizing VM and Capture VM Images
 - Upload an on-premise VHD to Storage Account and attach to VM as Data Disk
 - Working with Disk Snapshot
 - VM Disk Types
 - VM Sizes in Azure
 - Configuring VM Disk Encryption
 - Perform configuration management
- ✓ VM Extensions & VM Agents
- ✓ Custom Script Extensions
- ✓ Desired State Configuration (DSC)
- ✓ Access Extension
 - Virtual Machine Scale Sets
 - Configure VM monitoring, configure alerts, diagnostic and monitoring storage location.

✓ **Managing Data in Azure SQL Database**

- Introduction / Overview of SQL Database.
- Azure SQL Managed Instance
- Comparing SQL Azure Database to Azure / On-Premise SQL Server.
- Creating and Using SQL Server and SQL Database Services.
- Azure SQL Database Tools.
- Migrating on premise database to SQL Azure.
- Dynamic Data Masking
- Transparent Data Encryption
- Planning the Deployment of an Azure SQL Database
- Elastic Pools.
- Dynamic Data Masking
- Configure SQL Database Auditing
- Export and Import of Database using .bacpac
- Manage Business Continuity / Data Recovery
- Backup and Recovery options in SQL Database
- Active GEO-Replication
- Monitoring Azure SQL Database and Alerting

✓ **App Services – Web App**

- Introduction
- App Service - Application Types
- Deploy Web Apps
- ✓ Deploying Web App directly from Visual Studio
- ✓ Automate deployment from Dropbox and One Drive
- ✓ Create, configure and deploy packages
- ✓ Implement pre- and post-deployment actions
 - App Service plans
- ✓ Create App Service Plan
- ✓ Migrate Web Apps between App Service plans
- ✓ Create a Web App within an App Service plan
 - Configuring Web Apps
- ✓ Application Settings Configuration
- ✓ Database Connection Strings
- ✓ Configuring Handlers and Virtual Directories

- Manage App Services
- ✓ Configure a custom domain name
- ✓ Enable SSL for your custom domain
- ✓ Understanding Deployment Slots and Roll back deployments
- ✓ App Service Protection
- ✓ Manage Roles for an App service
 - Configure Web Apps for scale and resilience
- ✓ Horizontal and Vertical Scaling of a Web App
- ✓ Configure auto-scale
- ✓ Change the size of an instance
 - Monitoring, Debugging and Diagnosis
- ✓ Retrieve Diagnostics data
- ✓ View Streaming Logs
- ✓ Configure endpoint monitoring
- ✓ Configuring Alerts
- ✓ Configure diagnostics
- ✓ Use remote debugging
- ✓ Monitor Web App resources
 - Azure Traffic Manager to Scale out Globally

- ✓ **Azure Functions**
 - About Azure Functions.
 - Azure Webjobs vs Azure Functions
 - Create and Configure an Azure Function
 - Create an event processing function
- ✓ Http Triggered Function
- ✓ Timer Triggered Function
- ✓ Blog Storage Triggered Function
 - Implement an Azure-connected functions
- ✓ Adding message to Storage Queue
- ✓ Connecting to SQL Database
 - Creating Azure Functions through Visual Studio
 - Azure Durable Functions

✓ **Azure Logic Apps**

- Introduction
- Triggers and Actions
- Creating a Simple Logic App
- Handling array of Items using for-each and condition
- Logic App with Variables
- About Enterprise Application Pack
- Add Custom Function with Azure Function
- Creating Custom Connectors
- Using Custom API App in Logic App
- Azure Functions vs Logic Apps
- Building Logic Apps in Visual Studio.NET

✓ **App Service - API Apps**

- Introduction
- Creating an API App
- Deploying an API App
- Consuming an API App
- Authentication and Authorization in API App.
- Using API App in Logic App

✓ **API Management Service**

- Overview of API Management
- Components of API Management System.
- API Apps vs API Management.
- Create managed APIs.
- Configure API management policies.
- Protect APIs with rate limits.
- Add caching to improve performance.

✓ **Azure Service Bus**

- Service Bus Basics

- Hosting WCF Service in Azure
- Relayed Messaging
- Service Bus Queues
- Topics and Subscriptions
- Handling Transactions
- Handling Sessions

✓ **Azure Event Grid**

- Introduction
- Event Source and Event Handlers
- Comparing with Service Bus Queues and Topics
- Route storage events to Azure Functions
- Monitor VM changes using Event Grid and Logic Apps

✓ **Azure Event Hub**

- Overview
- Key Architecture Components
- Sample Event Producer and Consumer in C#

✓ **Key Vault**

- Secrets vs Keys Vs Certificates
- Accessing Keys and Secrets
- When to go for Key Vault
- Use Azure Key Vault from a Web Application
- Using Key Vault with ARM Template
- Encrypt and Decrypt BLOBS in Azure Storage

✓ **Redis Caching**

- Caching Overview
- What is Redis Cache
- Creating a Redis Cache & building Redis Cache Client

- Controlling Expiration

- ✓ **Azure CosmosDB Service**
 - What is CosmosDB
 - Global Replication and Consistency Levels
 - Understanding SQL Model database Schema
 - Creating and Saving Documents using Portal
 - Programming Schema
 - Adding / Editing / Deleting and Reading Documents

- ✓ **Azure Search Service**
 - About Search Service
 - Create Search Service
 - Create Index
 - Import Data
 - Handle Search Results
 - Programming Search in .NET using Azure Search SDK

- ✓ **Implement Azure Backup**
 - Overview of Azure Backup
 - Configure VM backup
 - Create Recovery Services Vault
 - Define and Implement backup policies
 - Perform VM restore
 - Perform backup operation
 - Configure and review backup reports

- ✓ **Manage Azure Subscriptions**
 - Understanding Azure Subscriptions
 - Configuring Role Based Access Control
 - RBAC using Portal

- RBAC using PowerShell and CLI
- Custom Roles for RBAC
- Managing Subscription Policies
- Locking Resources
- Checking Resources Limits
- Resource Tags

- ✓ **Managing and Securing Identities using Azure Active Directory**
 - Azure AD Introduction
 - Azure AD Editions
 - Managing Active Directories
 - Adding a custom domain name to Azure AD
 - Managing Azure AD Users, Groups and Devices
 - Adding Partner Users from other organization
 - Configure Windows 10 with Azure AD domain join
 - Synchronizing On-Premise AD Identities with Azure AD
 - Azure AD Connect
 - Azure AD User Sign-In Options
- ✓ Password Synchronization
- ✓ Passthrough Authentication
- ✓ Federated SSO
 - Multi Factory Authentication
 - Conditional Access Policy
 - Access Reviews
 - Privilege Identity Management
 - Integrating SaaS Applications with Azure AD for SSO
- ✓ Add Users and Groups to Application
- ✓ Revoke access to SaaS Applications
 - Managed Identities

- ✓ **Programming Secure Applications using Azure Active Directory**
 - Application Types Scenarios
 - Multi-Tenant vs Single-Tenant
 - Integrating ASP.NET MVC Applications with Azure AD

- Integrating ASP.NET Web API Applications with Azure AD
- Claims Based Authentication
- Role Based Authentication
- Implementing Azure AD B2C Collaboration
- Microsoft Graph API

✓ **Azure Monitoring and Log Analytics Workspace**

- Azure Monitor Overview
- Monitoring Metrics
- Monitoring Logs
- Log Analytic Workspace
- Collect data from Azure VM / Windows computer
- Azure Activity Logs
- Azure Diagnostics Logs
- Application Insight

✓ **Migrate Servers to Azure**

- Overview of Cloud Migration
- Azure Site Recovery
- Migrating the Virtual Machine
- Migrating the SQL Database
- Failover and Failback Process

✓ **DevOps Introduction**

- Traditional Software Development Life Cycle
- Waterfall Model
- About Agile Methodology.
- What is DevOps?
- DevOps Practices?
- The Challenge
- Benefits of DevOps over Traditional IT
- DevOps Tools

- What is CI and CD
- DevOps as a profession – DevOps Engineer

✓ **Azure DevOps**

- What is Azure DevOps
- Version History
- Azure DevOps Features
- Azure DevOps Tools and Project Life Cycle
- Create DevOps Account
- Create Organization
- Create Project and Get Started
- Create Users and invite team members

✓ **Azure Boards**

- Introduction
- Working with Work Items
- Epic, Feature, User Story, Task, Bug and Test Cases
- Linking Items
- Collaborate with Team members
- Follow a Work Item
- Dashboards
- Capacity Planning with Sprints
- List work items using Queries

✓ **Azure Repos, GitHub and GIT**

- Version control using Git
- What is Git, Azure Repos and GitHub
- Install Git Locally
- Getting Started with Git Commands
- Updating to DevOps Repository
- Working with Branches
- Merging Branches

- Creating and Committing a Pull Request
- Add a rule to Require a Review
- Squash Merging during Pull Request.
- Working with Merge Conflicts
- Cherry-Picking and Rebase
- Undo Changes using Reset and Revert
- Ignoring files using gitignore
- Managing Git Branches in Azure Repos
- Branch Policies and Branch Permissions
- Branches in Folders
- Working the GitHub Repositories
- Branching Workflow Types
- ✓ Feature Branching
- ✓ Gitflow Branching
- ✓ Forking Workflow
 - Summary of Git Commands

- ✓ **Continuous Integration using Azure Build Pipelines**
 - About Azure DevOps Pipeline
 - Understanding the Build Process
 - Create a Pipeline using Classic Editor
 - Enable Continuous Triggers for Build Pipeline
 - Add a status badge to Repository
 - Working with Task Groups
 - Validate Pull Request based on Build Pipeline result
 - Add a Widget to Dashboard

- ✓ **Continuous Integration using YAML Pipelines**
 - Understanding YAML file format
 - Building Azure DevOps Pipeline using YAML
 - Publishing results to Artifacts
 - Triggering Continuous Integration in YAML
 - Filtering Tasks based on branch being built
 - Using Templates to Build Multiple Configurations

- Build on Multi-Platform pipeline

- ✓ **Integrating Quality Tests in Azure Pipeline**
 - Overview of Testing
 - Add Unit Tests to your Application
 - Integrating Unit Test with CI Pipeline
 - Add the Test Widget to Dashboard
 - Perform Code Coverage Testing using Cobertura

- ✓ **Continuous Deployment using Azure Pipelines**
 - What is Continuous Delivery
 - Connecting to Azure Subscription
 - Deploying App to App Service using Designer
 - Multi-State Pipeline
 - Approvals and Gates
 - Working with Task Groups
 - Deploying App to Virtual Machine
 - Deploying App to App Service using YAML
 - Add the deployment State to the pipeline
 - Deploy Apps to Specific Environment
 - Deploy Azure Functions

- ✓ **Deep Dive into CI ad CD Pipeline**
 - Introduction
 - Retention Policies
 - About Build Agents
 - About Agent Pools
 - Create Self Hosted Windows Agent
 - About Libraries
 - Variables
 - Secure Files
 - Pipeline Conditions

- Pipeline Demands
- Integrating Pipeline with Microsoft Teams
- ✓ **Working with SQL Database**
 - Creating a Database Project
 - Database Deployment using DACPAC
 - Deploying Database using SQL Scripts in Pipeline
 - Using Multiple Stages and Approvals

- ✓ **IaC using ARM Templates**
 - About Infrastructure as Code (IaC)
 - About ARM Templates
 - Sample to Create Storage Account using ARM Template
 - Deploy Templates using PowerShell
 - Deploy Templates using Azure Portal
 - Deploy Templates using Azure Pipeline
 - Incremental and Complete Deployment
 - Creating VM using ARM Template
 - Create linked ARM Templates
 - Creating Resource Group and Resources at Subscription Level

- ✓ **IaC using Terraform Templates**
 - Overview of Terraform
 - Terraform Files Structure
 - Terraform Commands
 - Run a Terraform plan from Azure Cloud Shell
 - Provision Terraform Tasks in Azure Pipeline – Classic Editor
 - Provision Terraform Task in Azure Pipeline – YAML File

- ✓ **IaC using Ansible**
 - Overview of Ansible
 - Ansible Workflow
 - Ansible Components

- Installing Ansible
- Playbook Structure
- Executing a Playbook

✓ **Azure Artifacts**

- What are Artifacts
- Public and download Build Artifacts
- Publish and download Pipeline Artifacts
- Working with Feed and NuGet Packages
- Share Packages Publicly
- Public NuGet Package from Pipeline to NuGet Feeds
- Upstream Sources and View

✓ **Continuous Integration using Jenkins**

- Jenkins Management
- Adding a slave node to Jenkins
- Building Delivery Pipeline
- Pipeline as a Code

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