

## DevOps with Microsoft Azure

This course provides an in-depth understanding of **DevOps** practices using **Microsoft Azure**. It covers **Azure administration**, development, and the comprehensive suite of Azure **DevOps services**. Students will learn to create and manage Azure resources, implement continuous integration and delivery pipelines, and deploy and monitor applications efficiently. The course is designed for aspiring DevOps professionals, system administrators, developers, and IT managers who want to leverage Azure's powerful DevOps capabilities.

### Tech Stack To Be Covered



Azure



Devops



PAAS



SAAS



IAAS

## DevOps with Microsoft Azure

### Module 1: Introduction to Azure

1. Overview of Azure
2. Difference between IaaS, PaaS, and SaaS

## **Module 2: Azure Administration and Development**

### **1. Creating and Managing Azure Resources**

- Azure Resource Group
- Azure Virtual Machine
- Azure Recovery Services Vault
- Azure Load Balancer
- Azure Application Gateway
- Azure Virtual Network and Subnet
- Azure Storage Account
- Azure SQL Server
- Azure SQL Database
- Azure App Service Plan – App Service and Function App
- Azure Service Bus – Queue and Topics
- Azure Key Vault
- Azure Container Registry
- Application Insights
- Azure Monitor

### **2. Managing Virtual Machines with Azure PowerShell and CLI**

## **Module 3: Azure DevOps Fundamentals**

### **1. Introduction to Azure DevOps**

- DevOps Overview
- Azure DevOps Overview
- Creating an Account and Organization
- Licensing Details (Basic, Stakeholder, Enterprise Pro)

- Overview of Product Features
- Creating and Managing Azure DevOps Projects
- Adding and Modifying Users
- Setting up Teams

## **Module 4: Azure Boards**

### **1. Azure Boards**

- Basic, Scrum, Agile, and CMMI Processes
- Work Items, Backlogs, and Sprints
- Charts and Custom Queries

## **Module 5: Azure Repos**

### **1. Version Control in Azure DevOps**

- Git vs TFVC
- Setting up Git with Visual Studio Code
- Basic Git Commands
- Branches, Branching and Merging Strategies
- Pull Requests, Tags, Branch Policies, and Security

## **Module 6: Azure Pipelines and Artifacts**

### **1. Build Pipelines**

- Creating Build Pipelines for .NET and Java
- Agents in Azure Pipelines
- Self-Hosted vs Microsoft-Hosted Agents

- Build Tasks, Variables, and Multiple Concurrent Builds
- Continuous Integration (CI) and Scheduled Builds
- Build Retention Policies and Task Groups
- Customized Tasks and Artifact Management
- NuGet Packages and Share Feeds

## **Module 7: YAML Pipelines and SonarQube Integration**

### **1. YAML Pipelines**

- Creating Build Pipelines using YAML
- Multi-job and Multi-stage Pipelines
- Secrets Management with Azure Key Vault
- SonarQube Integration and Analysis
- Docker Build and Push in Azure DevOps

## **Module 8: Release Pipelines and Deployment**

### **1. Release Management**

- Key Concepts and Current State in TFS/VSTS
- Resource Provisioning with ARM Templates
- Common Tasks, Approval Workflow, and Deployment Groups
- Pre-deployment Conditions and Manual Intervention
- Releasing Web Applications to Azure Web Apps and IIS Servers

## **Module 9: ARM Templates**

### **1. Basics of ARM Templates**

- Introduction and Uses
- Creating Templates with VSCode
- Functions in ARM Templates (Arrays, Date, Comparisons, etc.)
- Creating Storage Accounts and Virtual Machines

## 2. Advanced ARM Template Topics

- Creating Multiple Instances of Azure VMs
- Linked Templates and Parallel Resource Creation
- Template Modulation and Deployment via PowerShell, CLI, Azure DevOps, and Portal

## **Module 10: Docker**

### 1. Basics of Docker

- Introduction, Images, and Containers
- Installation and Basic Dockerfile Commands
- Docker CLI Commands

### 2. Advanced Docker Topics

- Docker Volumes and Networking
- Docker Compose and Docker Swarm

## **Module 11: Terraform for Azure Cloud**

### 1. Basics of Terraform

- Introduction and Providers (AWS, Azure, GCP)
- Provisioners and CLI Commands
- Resources, Data Sources, and Modules
- Input/Output Variables and Functions

- Creating Terraform Files and Configuration Files
- Terraform in CI/CD Pipelines

## 2. Advanced Terraform Topics

- Dependencies, Triggers, Iterations, and Conditional Resources
- State Management and Backend Configuration
- Importing Resources

# Module 12: Kubernetes in Azure (AKS)

## 1. Basics of Kubernetes

- Introduction and Differences between Kubernetes and AKS
- Creating AKS Clusters with CLI
- AKS Architecture and Namespaces
- Workload Objects (Pods, Deployments, Replica Sets, etc.)

## 2. Kubernetes Services and Configurations

- ClusterIP, NodePort, LoadBalancer Services
- Secrets, ConfigMaps, Ingress, and Volumes

## 3. Advanced Kubernetes Topics

- Health Checks, Resource Quotas, Auto Scaling