

## Diploma in Microsoft Azure Cloud (6 Months)

**Duration:** 6 Months (~240 Hours)

**Mode:** Live Online / Classroom

**Tools & Technologies:** Azure Portal, Azure CLI, ARM Templates, Azure AD, Azure VNet, Azure Storage, Azure Key Vault, Azure DevOps, Terraform, Bicep, AKS, ACR, ADF, Synapse, Databricks, Event Hub, Power BI, Azure ML

**Certifications Prepared:** AZ-104: Microsoft Azure Administrator, AZ-400: Microsoft Azure DevOps Engineer Expert, DP-203: Data Engineering on Microsoft Azure, AI-102: Azure AI Engineer, PL-300: Power BI Data Analyst

## Course 1: Microsoft Azure Cloud Administration – Basics (3 Months)

### Syllabus

#### Week 1: Introduction to Azure & Cloud Concepts

- Cloud computing models (IaaS, PaaS, SaaS) and use cases
- Azure global infrastructure: regions, zones, data centers
- Navigating Azure Portal and Cloud Shell
- Azure CLI & PowerShell basics
- Subscription & Resource Groups overview
- Hands-on: Create Resource Group & VM using Portal + CLI
- Assignment

#### Week 2: Identity & Governance

- Azure Active Directory: users, groups, licenses
- Role-Based Access Control (RBAC) – roles, assignments
- Multi-Factor Authentication (MFA), Conditional Access policies
- Azure Policies & Governance basics
- Hands-on: Implement RBAC for Storage Access
- Assignment

#### Week 3: Networking in Azure

- Virtual Networks (VNETs), Subnets, IP Addressing
- VNet Peering, Service Endpoints, Private Endpoints
- Network Security Groups (NSG), Application Security Groups
- VPN Gateway & ExpressRoute overview
- Hands-on: Create VNet with public + private subnets

- Assignment

#### **Week 4: Compute Resources**

- Azure Virtual Machines: images, sizes, extensions
- VM Scale Sets & Autoscaling policies
- Load Balancers (internal & external), Azure Bastion
- Availability Sets vs Availability Zones
- Hands-on: Deploy Highly Available VM architecture
- Assignment
- Mock Interview 1

#### **Week 5: Storage Accounts**

- Blob Storage: hot, cool, archive tiers
- Azure Files, Azure Queues, Tables overview
- Storage security, SAS tokens, lifecycle policies
- Azure Backup and Azure Site Recovery basics
- Hands-on: Configure Blob Storage lifecycle management
- Assignment

#### **Week 6: Monitoring & Security Tools**

- Azure Monitor: metrics, logs, alerts
- Azure Log Analytics: workspaces & queries
- Application Insights basics
- Azure Security Center overview
- Hands-on: Configure monitoring for VMs + Storage
- Assignment

#### **Week 7: Databases & Key Vault**

- Azure SQL Database: DTU vs vCore models
- Elastic Pools, Backup & Restore
- Cosmos DB introduction (NoSQL, Global Distribution)
- Azure Key Vault: secrets, keys, certificates
- Hands-on: Secure DB connection with Key Vault
- Assignment

#### **Week 8: Capstone Project & Interview Prep**

- Project: Multi-tier Application Deployment (VM + SQL + Storage + Monitoring)
- Best practices for cost optimization & governance

- Assignment
- Mock Interview 2

## **Course 2: Microsoft Azure Cloud Administration – Advanced / DevOps (3 Months)**

### **Syllabus**

#### **Week 1: Infrastructure as Code (IaC)**

- ARM Templates: structure, parameters, deployment
- Bicep language: templates, modules, variables
- Terraform on Azure: providers, state management
- Hands-on: Deploy VM + Storage using Terraform
- Assignment

#### **Week 2: Azure DevOps Basics**

- Azure Repos (Git version control)
- Azure Pipelines (build pipelines, YAML vs classic)
- Boards & Agile project tracking
- Test Plans for CI/CD validation
- Hands-on: Create CI pipeline for Node.js application
- Assignment

#### **Week 3: CI/CD & Deployment Strategies**

- Continuous Integration vs Continuous Deployment
- Deployment Strategies: Blue-Green, Canary, Rolling
- Deployment Slots for App Services
- GitHub Actions vs Azure Pipelines
- Hands-on: Blue-Green Deployment of WebApp with Pipelines
- Assignment

#### **Week 4: Containers & Kubernetes (AKS)**

- Azure Container Registry (ACR) – build & push images
- Azure Kubernetes Service (AKS) setup & scaling
- Helm charts for deployment
- Load balancing containers in AKS
- Hands-on: Deploy Microservices into AKS using Helm
- Assignment

- Mock Interview 1

### **Week 5: Serverless Computing**

- Azure Functions: triggers, bindings, scaling
- Durable Functions (stateful workflows)
- Event Grid vs Service Bus vs Logic Apps
- Hands-on: Event-driven workflow with Azure Functions
- Assignment

### **Week 6: Monitoring & Security**

- Azure Monitor advanced features
- Application Insights with distributed tracing
- Azure Sentinel (SIEM) basics
- Hands-on: Configure Application Insights for WebApp
- Assignment

### **Week 7: Governance & Cost Management**

- Azure Policy, Blueprints for compliance
- Resource tagging & management locks
- Cost analysis, alerts, budgets
- Hands-on: Create governance policy for resource compliance
- Assignment

### **Week 8: Capstone Project & Interview Prep**

- Project: End-to-End CI/CD Pipeline (DevOps → AKS → Functions → Monitoring)
- Resume building tips for DevOps Engineers
- Assignment
- Mock Interview 2

## **Course 3: Microsoft Azure Data Engineering & AI (3 Months)**

### **Syllabus**

#### **Week 1: Data Storage & Lakehouse Architecture**

- Azure Data Lake Storage Gen2 features
- Blob Storage for analytics workloads

- Hierarchical namespace & partitioning best practices
- Hands-on: Create & configure Data Lake Gen2
- Assignment

### **Week 2: Data Integration with ADF**

- Linked Services, Datasets, Pipelines
- Copy Activity, Mapping Data Flows, Data Transformations
- Triggers & scheduling in ADF
- Hands-on: Build ETL pipeline (CSV → SQL DB)
- Assignment

### **Week 3: Azure Synapse Analytics**

- Dedicated vs Serverless SQL Pools
- External tables & PolyBase
- Synapse Studio features (queries, notebooks)
- Hands-on: Query data from Data Lake using Synapse
- Assignment

### **Week 4: Azure Databricks & Delta Lake**

- Databricks workspace & clusters setup
- Notebooks (Python, PySpark)
- Delta Lake for incremental ETL
- Hands-on: PySpark transformations on raw → curated data
- Assignment
- Mock Interview 1

### **Week 5: Real-Time Data Streaming**

- Event Hubs vs IoT Hubs – concepts & use cases
- Stream Analytics Jobs (SQL queries)
- Integration with Synapse & Power BI
- Hands-on: Stream real-time IoT data into dashboard
- Assignment

### **Week 6: NoSQL with Cosmos DB**

- API options: SQL, Mongo, Cassandra
- Partitioning & scaling throughput
- Consistency models (strong, eventual, bounded staleness)
- Hands-on: Ingest JSON data into Cosmos DB & query

- Assignment

### **Week 7: Visualization & BI**

- Power BI integration with Synapse & Data Lake
- Dataset refresh, row-level security
- Building interactive dashboards
- Hands-on: Build executive sales dashboard
- Assignment

### **Week 8: Azure ML & Capstone Project**

- Azure ML Workspace setup
- Model training with Designer & AutoML
- Model deployment to endpoints
- Monitoring ML lifecycle
- Project: End-to-End ETL + ML model + Power BI dashboard
- Assignment
- Mock Interview 2

### **Learning Outcomes**

- Administer Azure infrastructure (VMs, Storage, Networking, Databases)
- Implement DevOps workflows with Pipelines, IaC, AKS, Functions
- Design ETL & Real-Time Data Pipelines using ADF, Synapse, Databricks, Event Hub
- Deliver advanced analytics & AI solutions with Power BI & Azure ML
- Prepare for Microsoft Azure Certifications (AZ-104, AZ-400, DP-203, AI-102)
- Gain industry-ready expertise with projects and mock interviews