**Prerequisite**

1. Participants are already aware about Azure Platform and Dot Net (C#)
2. Trainer will do hands-on demonstrations during the session and participants need to understand it. Trainer will also provide a hands-on guide to follow later on.
3. Participants will be doing the hands-on after the session as homework exercises.
4. Session will be 20% theory and 80% practical.
5. Participants should have access to Azure account
6. Participants should have good internet speed and good quality headset to attend online session

**Note:**

1. The content is designed for 8 hours per day and can be delivered in 2 day\* 4 hours per day
2. Please refer to the course content on the next page.

**Day 1 (8 Hours)**

1. Starting with Azure
   * Creating resources and resource groups
2. Docker
   * What is Docker?
   * Why Docker?
   * How to setup Docker?
   * Creating and Using Containers
   * Container Images
     1. What's In An Image
     2. Using Docker Hub Registry Images
     3. Image Tagging and Pushing to Docker Hub
     4. Building Images: The Dockerfile Basics
     5. Building Images: Running Docker Builds
3. YAML basics
   * What is YAML?
   * Rules for Creating YAML file
   * Basic Components of YAML File
   * Synopsis of YAML Basic Elements
   * YAML – FULL LENGTH EXAMPLE
4. Kubernetes Introduction
   * What and Why of Kubernetes
   * Kubernetes Architecture
   * First Contact with Kubectl
   * Kubectl Describe
   * Kubectl Get
   * Kubectl Namespace Basics
   * Deploying Simple Pod to Kubernetes
5. Develop Azure compute solutions
   * The Virtual Machine Service
   * Deploying a virtual machine
   * Connecting to the Virtual Machine
   * Docker Containers Introduction
   * Understanding on how we deployed the Docker container
   * Deploying a .Net core application onto a Linux VM
   * Containerizing a .Net app
   * Azure Container Registry
   * Azure Container Instances
   * What is Kubernetes and Azure Kubernetes?
   * Creating a Kubernetes cluster
   * Understanding of application deployment to a Kubernetes cluster
   * What is a service principal

**Day 2 (8 Hours)**

1. Azure CDN
   * What is a content delivery network on Azure?
   * Create an Azure CDN profile and endpoint
   * Add Azure CDN to an Azure App Service web app
   * Add a custom domain to your endpoint
2. Set Azure CDN caching rulesDevelop Azure compute solutions
   * Azure Web App Service
   * Azure App Service Plan
   * Azure Web App - Linux App Service Plan
   * Azure Web App - Docker container
   * Azure Web Apps - App Service Logs
   * Azure Web App - Publishing from GitHub
   * Azure Web Apps - Deployment Slots
   * Azure App Service Plan - Linux
   * What are Azure Functions?
   * Creating a Function App
   * Understanding the Azure Function code
   * Azure Functions - Using normal classes
   * Azure Functions - Timer trigger
3. Develop for Azure Storage
   * What are storage accounts
   * Azure storage accounts - service types
   * Creating a storage account
   * Working with the BLOB service
   * Using Azure Storage Explorer
   * Using Access Keys
   * Azure Blob storage - .Net
   * Azure Blob properties and metadata
   * Shared Access Signatures
   * Storage Accounts - Access tiers
   * Storage Accounts - Blob snapshots
   * Storage Accounts - Soft Delete
   * Azure Table Storage
   * Azure Table Storage - Partition and Row Key
   * Azure Storage queue
   * Azure Functions - Queue binding
   * Azure Functions - Queue and Table binding
   * Azure Functions - Multiple Output bindings

**Day 3 (8 Hours)**

1. Introduction to Azure SQL Database
   * Azure Web App - Azure SQL Database
   * Using Azure Web App - Connecting strings
   * Azure Functions - Azure SQL Database
2. Azure Container Instances
   * Container Groups
   * Azure Container Instances - Container Groups - Container Registry
   * Azure Container Instances - Working with secrets
3. NoSQL Databases
   * Introduction to Cosmos DB
   * Azure Cosmos DB - SQL API
   * Partitioning in Azure Cosmos DB
   * Understanding the Item id property
   * Azure Cosmos DB - Time to Live
   * Replicating data globally
   * Consistency Levels
4. Implement Azure Security
   * What is Azure AD
   * Quick look at Azure AD users
   * Role Based Access Control
   * OAuth and OpenID Connect - Identity Provider
   * What is OAuth?
   * OAuth 2.0 - Overview
   * The Access Tokens
   * OAuth 2.0 - Accessing Blob storage
   * Azure AD - Multi-Factor Authentication
   * OpenID Connect
   * Azure Web Apps - Azure AD Authentication
5. Azure Key Vault
   * What is the Azure Key Vault Service
   * What is a service principal
   * Azure Key vault - Secrets
   * Managed Service Identity
6. Monitor, troubleshoot, and optimize solutions
   * Azure Monitor
   * What is Application Insights
   * Application Setup for Application Insights
   * Application Insights - Metrics and Performance
   * Application Insights - Availability Tests

**Day 4 (8 Hours)**

1. Azure Cache for Redis
   * What is Azure Cache for Redis?
   * Azure Cache for Redis - ASP.Net Core
   * Azure Redis Cache - Data Invalidation
2. Azure Service Bus
   * What is the Azure Service Bus?
   * Azure Service Bus - Queue Properties
   * Azure Service Bus - Queue - .Net
   * Azure Service Bus - Message Properties
   * Azure Service Bus - Message properties - .Net
   * Azure Service Bus - Topics
   * Azure Service Bus topic - filters
   * Azure Service Bus - Dead letter queues
   * Azure Service Bus - Creating a queue - .Net
3. Azure Event Grid
   * What is the Azure Event Grid Service?
   * Azure Event Grid - Azure Functions
4. Azure Event Hubs
   * What are Azure Event Hubs?
   * Azure Event Hubs Architecture
   * Azure Event Hub Components
   * Azure Event Hub - Working with Partitions - .Net
   * Azure Event Hub - Reading from an Offset
   * Azure Event Hub - Event Processor
5. Azure API Management
   * Azure API Management Overview
   * The purpose of the service
   * Azure API Management - Setting up the API
   * Azure API Management - Deployment
   * Azure API Management - Policies
   * Azure API Management - Policy - Rewrite URL's
   * Azure API Management - Policies - Conditions
   * Azure API Management - Policy - Outbound Rule
   * Azure API Management - OpenAPI Specification
6. Azure Logic Apps
   * What is Azure Logic Apps?
   * Azure Logic Apps - Azure Functions
   * Azure Logic Apps - Azure Blob Storage

**Day 5 (8 Hours)**

1. Understanding of Python
2. Python Environment Set-up and Installation
3. Jupyter Notebook Overview
4. Python Basics
   * Data Types
     1. Numbers
     2. Strings
     3. Print Formatting
     4. Lists
     5. Dictionaries
     6. Booleans
     7. Tuples and Sets
5. Python Operators
6. If, elif and else Statements
7. Loops in Python
8. Errors & Exceptions
   * Try – except
   * Assert, Raise
   * Finally
9. File handling
   * Syntax
   * How to Open File
   * Read Lines
   * Write to an Existing File
   * Create a New File
   * Delete a File
10. Using NumPy Package in Python
    * Why use NumPy?
    * Numpy Arrays
    * Numpy Array Indexing
    * Numpy Array Manipulation
    * Numpy Operations
    * Various useful Numpy functions
    * Broadcasting
11. Using Pandas Package in Python
    * DataFrames
    * Groupby
    * Merging Joining and Concatenating
    * Read Excel, JSON, XML files

**Day 6 (8 Hours)**

1. Azure Data Lake Basic
   * What is Azure Data Lake?
   * Azure Data Lake Architecture
   * Creating Azure Data Lake Account
   * Hierarchical Namespace
   * Exploring Data Lake Analytics
2. Introduction to Azure Data Factory
3. Provisioning a Data Factory service
4. Building Blocks of Data Factory
   * Activities
   * Pipeline
   * Triggers
   * Linked Service
5. Copy Data Activity
   * Copy files from local filesystem to Azure SQL Database
6. Connections and Integration Runtime
7. Create
   * Pipeline
   * Data Flows
   * Data Sets
   * Linked Services
8. Control Flow Activities
   * Get Metadata Activity
   * Filter Activity
   * If Activity
   * Append Activity
   * Wait Activity
   * ForEach Loop Activity
9. Schedule Azure Data Factory Pipelines
10. Data Flow Transformation
    * Source Transformation
    * Sink Transformation
    * Conditional Split Transformation
    * Derived Column Transformation
    * Lookup Transformation
    * Select Transformation
    * Filter Transformation
    * Join Transformation
    * Exists Transformation
    * Load records in respective tables based on their department

**Day 7 (8 Hours)**

1. Data Bricks Overview
2. Introduction to Databricks and Apache Spark
   * Introduction to databricks
   * Write your first Apache Spark Code
   * Apache Spark Architecture: How Apache Spark runs on a cluster
3. The DataFrame API: Basics
   * Create a DataFrame from a CSV file
   * How to select columns from a DataFrame
   * Understand the DataFrame Schema
4. Data Sources
   * DataFrameReader: Read CSV Files
   * DataFrameReader: Read JSON Files
   * DataFrameWriter: Write Data
   * Create DataFrame manually
5. Create a Workspace
6. Azure Databricks concepts
   * Workspace
     1. Notebook
     2. Dashboard
     3. Library
     4. Experiment
   * Computation management
     1. Cluster
     2. Job
   * Authentication and authorization
     1. User
     2. Group
     3. ACL
7. Notebooks
   * Manage notebooks
     1. Create a notebook
     2. Open a notebook
     3. Delete a notebook
     4. Copy notebook path
     5. Rename a notebook
     6. Control access to a notebook
     7. Schedule a notebook
   * Dashboards
     1. Dashboards notebook
     2. Create a scheduled job to refresh a dashboard
     3. View a specific dashboard version
8. Spark Jobs
   * View jobs
   * Create a job
   * View job details
   * Run a job
   * View job run details
   * Export job run results
9. Library dependencies
   * Manage library dependencies
10. Administration
    * Access the Admin Console
    * Manage users and groups
      1. Manage users
      2. Manage groups
    * Enable access control
      1. Enable workspace object access control
      2. Enable cluster access control for your workspace
      3. Enable pool access control for your workspace
      4. Enable jobs access control for your workspace
      5. Manage personal access tokens
      6. Conditional access

**Day 8 (8 Hours)**

1. DevOps Introduction
   * DevOps and Evolution of Software Development
   * Before DevOps - Evolution to Agile
   * DevOps - An Overview
2. What is Infrastructure as Code?
3. What is Continuous Integration, Deployment and Delivery?
4. Understand Varios Devops Tools
   * Jenkins Introduction
   * Terraform
     1. Installing Terraform
     2. Deploying Infrastructure with Terraform
        1. Deploy VM
        2. Deploy Azure App Service
     3. Read, Generate, Modify Configurations
        1. Overview
        2. Understanding Attributes and Output Values in Terraform
        3. Referencing Cross-Account Resource Attributes
        4. Terraform Variables
        5. Approaches for Variable Assignment
        6. Data Types for Variables
        7. Fetching Data from Maps and List in Variable
        8. Count and Count Index
        9. Conditional Expressions
        10. Local Values

**Day 9 (8 Hours)**

1. Azure DevOps - Continuous Integration, Deployment & Delivery
   * What is Azure DevOps?
   * Setting up Git Repo for Azure DevOps Pipeline
   * Creating your first Azure DevOps Pipeline
   * Azure DevOps - Agents and Jobs
   * Hands-On
   * Using dependsOn with Jobs
   * Creating Azure DevOps Pipeline for Stages
   * Variables and dependsOn for Stages
   * Understanding Azure DevOps Pipeline Variables
   * Creating Azure DevOps Tasks for Copy Files and Publish Artifacts
   * Running Azure DevOps Jobs on Multiple Agents
   * Hands-On
   * Understanding Azure DevOps Deployment Jobs - Environments and Approval
   * Build and Push Docker Image in Azure DevOps
   * Hands-On
2. DevOps on Azure AKS Kubernetes Clusters - Docker, Azure DevOps & Terraform
   * IAAC - Azure AKS with Azure DevOps, Terraform & Kubernetes
   * Review Terraform Configuration for Azure Kubernetes Cluster Creation
   * Setting up Client ID, Secret and Public Key for Azure Kubernetes Clust
   * Creating Azure DevOps Pipeline for Azure Kubernetes Cluster IAAC
   * Performing Terraform apply to create Azure Kubernetes Cluster in Azure
   * Installing Azure CLI
   * Connecting to Azure Kubernetes Cluster using Azure CLI
   * Hands-On
   * Creating Azure DevOps Pipeline for Deploying Microservice to Azure AKS
   * Managing Pipelines & Github Repos for Kubernetes and Microservices
   * Creating V2 and Enable Build and Push of Docker Image
   * Performing Terraform destroy to delete Azure Kubernetes Cluster in Azu
   * Review of Terraform destroy
   * Hands-On