

# DEVOPS CONTENT

## Introduction

01

- Cloud Computing -  
What is it and why Cloud compared to On-premises?
- Different Cloud Vendors
- Characteristics of Cloud Computing
- Cloud Models - Public, Private and Hybrid Cloud
- Cloud Computing Services - IaaS, PaaS & SaaS
- Cloud Computing Benefits and Considerations

## Azure Administration

02

- Learn about Azure Architecture
- Introduction to Azure Portal and Subscription
- Create Azure Free Trial Account
- Azure Compute Services
- **Azure Networking Services (NSG's and ASG's)**
- Azure Storage Services
- **Azure Load Balancers**
- Azure Auto Scaling
- **Azure Security Practices**
- Create Virtual Machines, Virtual Networks and Storage Accounts
- Create SQL Server & DB
- Work with Azure Active Directory (AAD)
- Azure Support Plans, Azure Pricing & TCO Calculator Azure Server-less Computing
- Introduction to Serverless computing
- Azure Functions

## Linux

03

- Introduction to Linux
- Command line utilities and basic commands File Hierarchy, File Management & Navigation Users, Groups, Permissions, copying and moving files
- Text Editors - Vi & Nano
- Package Management
- **Linux Firewall**
- **System Security & Auditing**
- **Accessing Root Accounts and Servers with SSH Passwords. Public and private keys**

## PowerShell and Azure CLI

04

- Powerful scripting tool, Understand the basics of PowerShell
- Automating daily activities on Azure using PowerShell
- Connect to an Azure subscription using Azure PowerShell
- Create Azure resources using Azure PowerShell
- Creating of Virtual Machines, Storage Accounts and Virtual Networks using PowerShell
- Use PowerShell to Automate daily activities
- Understand the basics of Azure CLI
- Understanding of how to use Azure CLI to Create resources on Azure

## Git and Azure Repos

05

- What is Version Control System?
- Git Introduction & Setup
- Compare Git with others and why is it called Distributed Version Control System?
- Create a Local Git Repository
- Operations - Commit, Pull, Push, Clone, Merge, Cherry Pick and Rebase
- Git Branches'
- Introduction to Azure Repos
- Branching and Merging Strategies
- Pull Requests in Azure Repos
- **Configuring Permissions and Security**

## Project Management

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- Methodologies- Waterfall model
- Scrum and Agile Methodology
- Work Items in Azure Boards
  - Epics
  - Features
  - User Stories
  - Bugs
- **Workflows and Approvals**

## Azure DevOps

07

- Learn to implement a complete Project Lifecycle in Azure DevOps using the below Azure DevOps Services
  - \* Azure Boards
  - \* Azure Repos
  - \* Azure Pipelines
  - \* Azure Test Plans
  - \* Azure Artifacts
- Azure Extensions Marketplace

## CICD in Azure DevOps

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- Introduction to YAML
- Build Pipelines (CI)
- Release Pipelines (CD)
- Continuous Deployment vs. Continuous Delivery:
- Artifactory
- Service Connections
- Agent Pools
- **Gates and Approvals**
- Classic Pipelines

## SonarQube

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- **Introduction to SonarQube**
- **Core Concepts and Metrics**
- **Architecture and Integration**
- **Practical Workflow**
- **Security and SAST**

## Terraform

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- Introduction to Infrastructure-as-Code (IaC) -Terraform
- Terraform Installation and Configuration
- Terraform workflow
- Provisioning and managing
- Azure Cloud infrastructure/Resources using Terraform

## Docker

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- Introduction to Docker, Docker Container, DockerHub, Azure Container Registry (ACR), Azure Container Instances (ACI)
- Build a Dockerized Web application
- Logging techniques
- Exploring Scalability with Docker

## Kubernetes for DevOps

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- Understand Orchestration platforms
- Introduction to Kubernetes
- Understand the Kubernetes API
- Kubernetes Application Architecture
- Kubernetes Networking
- Storage in Kubernetes
- Kubernetes Pod and Node
- Kubernetes Cluster Deployment and Scaling
- Security in Kubernetes
- Deploy WebServer on Azure Kubernetes Service (AKS)
- Auto Scaling Containers on AKS
- Configuring Load Balancers on AKS
- Troubleshooting issues on AKS Cluster

## Biceps

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- Introduction to Bicep & Why It's Used
- Designing Bicep Templates (Parameters, Variables, Resources, Outputs)
- Creating & Deploying Your First Bicep Template
- Working with VS Code & Bicep Extensions
- Deploying Bicep Using Azure CLI & Managing Resources
- Bicep Best Practices & Template Sharing

## Istio

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- Service Mesh with Built in Security
- Functionality
- Security Role
  - Mutual TLS (mTLS)
  - Authorization
  - Secure Naming

## **GitHub Actions**

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- **Introduction to GitHub Actions**
- **Anatomy of a Workflow**
- **Build & Test Automation**
- **Deployments with GitHub Actions**
- **Reusable Workflows & Composite Actions**
- **CI/CD Best Practices**

## **AI 900 Azure AI Fundamentals**

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- **Introduction to AI and ML**
- **Exploring Azure AI Services**
- **Generative AI in Azure**
- **Custom Vision and Azure ML**
- **Responsible AI principles**