AVENTURE

INFINITE POSSIBILITIES

Cloud & DevOps Course Outline

Course Modules

Part 1: Cloud Administration

Module 1: Introduction to Cloud Computing

- Overview of Cloud Computing
- Benefits of Cloud Solutions
- Cloud Service Models: IaaS, PaaS, SaaS
- Introduction to Azure, AWS, and GCP

Module 2: Azure Administration

- Azure Resource Manager (ARM)
- Virtual Machines (VMs) and Storage
- Networking in Azure
- Identity and Access Management (IAM) in Azure
- Monitoring and Management with Azure Monitor and Azure Security Center
- Azure Load Balancer and Application Gateway
- Azure Front Door and Traffic Manager
- Azure App Services and Azure Functions
- Azure CDN
- Azure Logic Apps

Module 3: AWS Administration

- AWS Management Console and CLI
- EC2 Instances and Storage Solutions
- AWS Networking and VPCs
- Identity and Access Management (IAM) in AWS
- Monitoring with CloudWatch and AWS Security Best Practices
- AWS Elastic Load Balancer (ELB)
- AWS Elastic Beanstalk

Module 4: GCP Administration

- Google Cloud Console and gcloud CLI
- Compute Engine and Storage Solutions
- GCP Networking and VPCs
- Identity and Access Management (IAM) in GCP

- Monitoring with Stackdriver and GCP Security Best Practices
- GCP App Engine
- GCP Firewall

Part 2: Backup and Disaster Recovery (DR)

Module 5: Backup and Disaster Recovery

- Overview of Backup and DR Concepts
- Implementing Backup Solutions in Azure
- Implementing Backup Solutions in AWS
- Implementing Backup Solutions in GCP
- Designing DR Strategies for Cloud Environments

Part 3: Version Control and Continuous Integration

Module 6: Version Control with Git

- Introduction to Git and GitHub
- Git Workflow and Branching Strategies
- Collaboration with Pull Requests and Code Reviews
- Git Best Practices

Module 7: Continuous Integration with Jenkins

- Introduction to Continuous Integration (CI)
- Setting Up Jenkins
- Creating and Managing Jenkins Pipelines
- Integrating Jenkins with Git
- Automated Testing and Reporting

Part 4: Containerization and Orchestration

Module 8: Containerization with Docker

- Introduction to Docker
- Docker Installation and Setup
- Creating and Managing Docker Containers
- Docker Images and Dockerfile
- Docker Compose for Multi-Container Applications

Module 9: Orchestration with Kubernetes

- Introduction to Kubernetes
- Kubernetes Architecture and Components
- Setting Up a Kubernetes Cluster
- Managing Pods, Services, and Deployments
- Kubernetes Networking and Storage
- Continuous delivery (CD) tools: Argo CD, Spinnaker
- Package Manager: Helm

Part 5: Cloud-Native Services and DevOps

Module 10: Azure Container Instances (ACI) and Azure Container Apps (ACA)

- Introduction to ACI and ACA
- Deploying and Managing Containers with ACI
- Building and Deploying Microservices with ACA
- Monitoring and Scaling ACI and ACA

Module 11: Azure Container Registry (ACR) and Azure Kubernetes Service (AKS)

- Introduction to ACR and AKS
- Creating and Managing Container Registries with ACR
- Deploying and Managing Kubernetes Clusters with AKS
- Integrating ACR with AKS

Module 12: AWS Elastic Kubernetes Service (EKS)

- Introduction to AWS EKS
- Setting Up and Managing EKS Clusters
- Deploying Applications on EKS
- Integrating ECR with EKS

Module 13: GCP Google Kubernetes Engine (GKE)

- Introduction to GCP GKE
- Setting Up and Managing GKE Clusters
- Deploying Applications on GKE
- Integrating Container Registry with GKE

Part 6: Infrastructure as Code (IaC)

Module 14: Terraform for Infrastructure as Code

- Introduction to Terraform
- Setting Up Terraform

- Writing Terraform Configuration Files
- Managing Infrastructure with Terraform
- Best Practices for Terraform

Module 15: ARM Templates and Bicep

- Introduction to ARM Templates
- Writing and Deploying ARM Templates
- Introduction to Bicep
- Converting ARM Templates to Bicep
- Best Practices for ARM and Bicep

Module 16: Ansible for Configuration Management

- Introduction to Ansible
- Setting Up Ansible
- Writing Ansible Playbooks
- Managing Infrastructure with Ansible
- Best Practices for Ansible

Module 17: Puppet for Configuration Management

- Introduction to Puppet
- Setting Up Puppet
- Writing Puppet Manifests
- Managing Infrastructure with Puppet
- Best Practices for Puppet

Part 7: Monitoring and Logging

Module 18: Monitoring with Prometheus and Grafana

- Introduction to Prometheus
- Setting Up and Configuring Prometheus
- Visualizing Metrics with Grafana
- Creating Dashboards and Alerts in Grafana
- Best Practices for Monitoring with Prometheus and Grafana

Module 19: Monitoring and Logging with Nagios

- Introduction to Nagios
- Setting Up and Configuring Nagios
- Monitoring Servers and Applications with Nagios
- Integrating Nagios with Grafana

Part 8: DevOps Practices

Module 20: Azure DevOps

- Introduction to Azure DevOps
- Setting Up Azure Repos, Pipelines, and Artifacts
- Continuous Integration and Continuous Deployment (CI/CD) with Azure Pipelines
- Managing Projects with Azure Boards
- Best Practices for Azure DevOps
- Integrating SonarQube with Azure DevOps
- Integrating Terraform with Azure DevOps

Module 21: AWS DevOps

- Introduction to AWS DevOps
- Setting Up AWS CodePipeline, CodeBuild, and CodeDeploy
- Implementing CI/CD Pipelines with AWS DevOps Tools
- Monitoring and Logging with AWS CloudWatch and CloudTrail
- Best Practices for AWS DevOps
- Integrating SonarQube with AWS DevOps
- Integrating Terraform with AWS DevOps

Module 22: GCP DevOps

- Introduction to GCP DevOps
- Setting Up Cloud Build, Cloud Source Repositories, and Cloud Deploy
- Implementing CI/CD Pipelines with GCP DevOps Tools
- Monitoring and Logging with Stackdriver
- Best Practices for GCP DevOps
- Integrating SonarQube with GCP DevOps
- Integrating Terraform with GCP DevOps

Capstone Project

- Real-world Cloud Administration and DevOps Project
- Designing and Implementing a Full CI/CD Pipeline
- Deploying Multi-Cloud Applications
- Monitoring and Optimizing Cloud Resources
- Presentation and Defense of the Project

Assessment and Certification

- Quizzes and Exams

- Practical Lab Assessments
- Final Project Evaluation
- Certification of Completion