edureka!
Discover Learning

Cloud Architect Masters Program

About Edureka

Edureka is a leading e-learning platform providing live instructor-led interactive online training. We cater to professionals and students across the globe in categories like Big Data & Hadoop, Data Science, Machine Learning, Business Analytics, NoSQL Databases, Java & Mobile Technologies, System Engineering, Project Management and Programming.

We have an easy and affordable learning solution that is accessible to millions of learners. With our students spread across countries like the US, India, UK, Canada, Singapore, Australia, Middle East, Brazil and many others, we have built a community of over 1 million learners across the globe.

About the Course

Edureka's Masters Program offers an in-depth knowledge of how to design, plan, and scale your cloud implementation with recommended best practices. As part of this program, you will get access to 11 specialization courses. The entire program is a structured learning path recommended by leading industry experts and ensures that you transform into an expert Cloud Solutions Architect.

Index

**Depending on industry requirements, Edureka may make changes to the course curriculum*

edureka!
Discover Learning

Python Scripting

Module Curriculum

About the Course

Python Scripting allows programmers to build applications easily and rapidly. This course is an introduction to Python scripting, which focuses on the concepts of Python. It will help you to perform operations on variable types. You will learn the importance of Python in real time environment and will be able to develop applications based on Object Oriented Programming concept.

Course Outline

Module 1: Introduction to Python

Learning Objective:

Give brief idea of what Python is and touch on the basics.

Topics:

- Overview of Python
- The Companies using Python
- Other applications in which Python is used
- Discuss Python Scripts on UNIX/Windows
- Variables
- Operands and Expressions
- Conditional Statements
- Loops
- Command Line Arguments
- Writing to the screen

Hands-On:

- Creating “Hello World” code
- Variables

- Demonstrating Conditional Statements
- Demonstrating Loops

Module 2: Sequences and File Operations

Learning Objective:

Learn different types of sequence structures, related operations, and their usage. Also learn diverse ways of opening, reading, and writing to files.

Topics:

- Python files I/O Functions
- Lists and related operations
- Tuples and related operations
- Strings and related operations
- Sets and related operations
- Dictionaries and related operations

Hands-On:

- Tuple - properties, related operations, compared with list
- List - properties, related operations
- Dictionary - properties, related operations
- Set - properties, related operations

Module 3: Deep Dive – Functions, OOPs, Modules, Errors and Exceptions

Learning Objective:

In this Module, you will learn how to create generic python scripts, how to address errors/exceptions in code and finally how to extract/filter content using regex.

Topics:

- Functions
- Function Parameters
- Global variables
- Variable scope and Returning Values
- Lambda Functions
- Object Oriented Concepts
- Standard Libraries
- Modules Used in Python (OS, Sys, Date and Time etc.)
- The Import statements
- Module search path
- Package installation ways
- Errors and Exception Handling
- Handling multiple exceptions

Hands-On:

- Functions - syntax, arguments, keyword arguments, return values
- Lambda - features, syntax, options, compared with the functions
- Sorting - sequences, dictionaries, limitations of sorting
- Errors and exceptions - types of issues, remediation
- Packages and module - modules, import options, sys path

Module 4: Introduction to NumPy & Pandas

Learning Objective:

This Module helps you get familiar with basics of statistics, different types of measures and probability distributions, and the supporting libraries in Python that assist in these operations.

Topics:

- NumPy - arrays
- Operations on arrays
- Indexing slicing and iterating
- Reading and writing arrays on files
- Pandas - data structures & index operations
- Reading and Writing data from Excel/CSV formats into Pandas

Hands-On:

- NumPy library- Installation, Creating NumPy array, operations performed on NumPy array
- Pandas library- Installation, creating series and dataframes, Importing and exporting data

Module 5: **Data Visualisation**

Learning Objective:

In this Module, you will learn in detail about Data Visualization.

Topics:

- Matplotlib library
- Grids, axes, plots
- Markers, colours, fonts, and styling
- Types of plots - bar graphs, pie charts, histograms
- Contour plots

Hands-On:

Matplotlib - Installation, Using Scatterplot, histogram,bar graph, pie chart to show information, Styling of Plot

edureka!
Discover Learning

Fundamentals of Cloud Computing

masters program

Course Curriculum

About the Course

Cloud Computing provides us means by which we can access the applications as utilities over the internet. It allows us to create, configure, and customize the business applications online. This self-paced course is designed to guide you through a step-by-step approach in learning theoretical concepts of Cloud Computing.

Course Outline

Module 1 : Introduction to Cloud Computing?

Learning Objective:

After completing this course, students should be able to discuss about various companies implementing Cloud Computing, learn the basics of Cloud Computing, understand the various Cloud Deployment Model, discuss various Cloud Services Model and learn theoretical concepts of Cloud Virtualization.

Topics:

- What is Cloud Computing?
- Why Cloud Computing?
- Characteristics of Cloud Computing
- Cloud Computing – Technologies
- Cloud Deployment Model
- Cloud Service Model
- Cloud Services – Users
- Cloud Virtualization
- Cloud – UseCase

edureka!
Discover Learning

AWS Architect Certification Training

masters program

Course Curriculum

About the Course

AWS Certification by Edureka is curated by industry professionals as per the industry requirements and demands. It will help you prepare for the AWS Certified Solutions Architect - Associate exam SAA-C02 With Edureka's instructor-led sessions, you will be able to effectively architect and deploy secure and robust applications using AWS. This course will helpyou identify the appropriate AWS service based on databases, network, storage, cost optimization, compute, and security requirements.

Course Outline

Module 1 : Introduction to AWS

Goal:

In this module, you will learn about the different services provided by AWS. You will be provided with an overview of the important resources required to architect an application.

Objective:

- Understand different classic data center elements
- Know need of virtualization
- Define Cloud Computing
- Categorize different Cloud Computing Service and Deployment models
- Describe AWS Global Infrastructure
- Categorise Services available in AWS
- Work with CLI and Management Console

Topics:

- Classic Data Center
- Virtualization
- Cloud and Cloud Computing
- Cloud Computing Service Models
- Cloud Computing Deployment Models
- Service Comparison: AWS, Azure, and GCP
- Amazon Web Services (AWS) and its Benefits
- AWS Global Infrastructure
- AWS Regions and Replication of data between the Regions
- Availability Zones and High Availability
- AWS Edge Location
- Different Amazon Web Services
- Ways to access AWS: CLI, Console, and SDKs

Hands-On:

- Sign-up for AWS free-tier account
- Explore Console and Configure CLI

Module 2 : Security Management in AWS

Goal:

In this module, you will learn about how to securely manage your application and your AWS account using various Amazon security services.

Objective:

- Work with IAM Service
- Manage IAM Components
- Recognize the Best Practices of IAM
- Manage the keys using KMS
- Access and create alerts on billing

Topics:

- User management through Identity Access Management (IAM)
- Various access policies across AWS Services

- Security Token Services
- AWS Resource Access Manager (RAM),
- AWS Single Sign-On (SSO)
- AWS Cognito
- AWS Security & Encryption: KMS, CloudHSM, Shield, WAF, Guard Duty
- API keys service access
- Best practices for IAM
- Access billing and create alerts on billing

Hands-On:

- Create new users who can login to AWS console
- Create role for an application to access S3
- Create policies for new user to have either admin or limited privileges
- Configuring Strong and Secure Authentication Access Mechanism using Amazon Cognito
- Configure WAF to Protect Website from Attacks
- Monitoring Malicious Activity or Unauthorized Behaviour via GuardDuty

Module 3 : Object Storage Options

Learning Objective:

In this module, you will learn about the different Object Storage Services offered by AWS, identify when to use a specific service, how to store/transfer data using these services and optimize the storage cost.

Objective:

- Understand Traditional Storage
- Work with Amazon S3
- Know the benefits of using Amazon Glacier
- Work with CloudFront
- Get an overview of Snowball
- Understand the concepts of Storage Gateway

Topics:

- Traditional Storage
- Need to Move to Cloud Storage
- Traditional vs. Cloud Storage Cost
- Cloud Storage
- Different Storage Options Available on AWS
- Simple Storage Service (S3) and Its Components

- Working of S3
- Difference Between S3, EBS and EFS
- Bucket Policy
- Access Control List(ACL)
- Versioning
- Cross-Region Replication (CRR) and Its Use Case
- Amazon S3 Transfer Acceleration
- Choice of Storage Classes on S3
- Lifecycle Policy of S3 Bucket
- CDN: CloudFront and AWS Global Accelerator
- Storage Gateways

Hands-On:

- Hosting a Static Website on Amazon S3
- Versioning in AWS S3
- Replicating data across regions
- Transfer and retrieve data from Glacier through lifecycle policy
- Direct Data Migration to Amazon S3 Glacier Vault via AWS CLI
- Accessing a static website through CloudFront
- File Share via AWS Storage Gateway

Module 4 : Amazon EC2

Goal:

EC2 (Elastic Compute Cloud) is the backbone of AWS. In this module, you will learn about the concepts associated with an EC2 instance and its usage. This module covers different AMIs, a demo on launching an EC2 instance, ways to connect with an instance, and how to host a website on EC2 instance.

Objective:

- Understand Virtualization
- Work with EC2
- Understand Amazon Machine Image (AMI)
- Describe Security Groups, Key-pairs and Tenancy
- Differentiate between elastic IP and public IP
- Analyze various EC2 box configurations available
- Categorize different storage options associated with EC2 instance

Topics:

- Virtualization
- Amazon Elastic Compute Cloud (EC2) and Its Benefits
- Amazon Machine Image (AMI)

- Security Groups in AWS
- Authentication through Key-pair
- Hardware Tenancy – Shared vs. Dedicated
- Networking Layer in EC2: VPC
- Elastic Network Interface (ENI) and Its Attributes
- Different Categories of IP Address
- Public IP vs. Elastic IP
- Instance Store
- Elastic Block Store (EBS), Its Features and Volume Types
- Solid State Drive: General Purpose SSD and Provisioned IOPS
- Hard Disk Drive: Throughput Optimized HDD and Cold HDD
- Snapshots
- Elastic File System (EFS) and Its Features
- EBS vs. EFS
- Amazon FSx: Windows File Server and Lustre

Hands-On:

- Host your website inside EC2
- Create an AMI
- Create an Elastic IP
- Attaching an EBS volume externally
- To create a snapshot
- Mount EFS volumes
- Mount FSx into windows servers and share same file

Module 5 : Load Balancing, Auto-Scaling and Route 53

Goal:

In this module, you will learn the concepts of Load Balancing, Auto-Scaling, and Route 53 to manage traffic.

Objective:

- Instrument various Load Balancers
- Setup Auto-Scaling
- Specify components and policies of Auto-Scaling
- Hosting Domains using Route 53

Topics:

- Elastic Load Balancer and its types
- Advanced features of ELB
- Launch Templates
- Launch Configurations
- Comparison of Classic, Network and Application Load Balancer

- Auto-Scaling
- Components of Auto-Scaling
- Lifecycle of Auto-Scaling
- Auto-Scaling policy
- Working of Route 53
- Various Routing Policies

Hands-On:

- Create a Classic Load Balancer
- Create a Network Load Balancer
- Work with Application Load Balancer and Auto-Scaling
- Auto-Scaling and Scaling policy
- Maintaining the User Experience with Low Latency Using Route 53 Traffic Flow Feature

Module 6 : Database Services and Analytics

Goal:

In this module, you will learn about the different database services offered by AWS to handle structured and unstructured data. This module also gives you knowledge on how to analyze your data.

Objective:

- Classify different AWS database services
- Understand the working of RDS
- Describe Aurora
- Perform CRUD operations on DynamoDB
- Implement ElastiCache
- Understand Amazon RedShift
- Work with Kinesis

Topics:

- Amazon RDS and its benefits
- Read Replica
- RDS IAM Authentication
- Aurora : Aurora Serverless and Global Databases
- DynamoDB
- ElastiCache : Working, Redis vs Memcached
- Amazon RedShift: Redshift Spectrum
- Kinesis: AWS Kinesis Data Streams, AWS Kinesis Data Firehouse
- AWS Lake Formation
- AWS Athena
- AWS QLDB

Hands-On:

- Storing an application data in MySQL DB using Relational Database Service (RDS)
- Creating Tables, loading sample data and running queries
- Cache the static and frequently accessed application data in the memory using Amazon ElastiCache
- Moving an Airline data From S3 to AWS Redshift and Query the data via Redshift Editor
- Design Solution using Amazon Kinesis Data Steam, Kinesis Firehose, Kinesis Analytics

Module 7 : Networking and Monitoring Services

Goal:

This module introduces you to the Amazon Virtual Private Cloud. You will learn to implement networking using public and private subnets with VPC. Also, this module demonstrates how to monitor your resources.

Objective:

- Understand Subnet, Subnet Mask, benefits of VPC and its components
- Differentiate between Default and Non-Default VPC
- Create VPC Wizard Scenarios for VPC
- Understand the VPN and Direct Connect
- Schedule CloudTrail
- Monitor other services using CloudWatch
- Understand Trusted Advisor

Topics:

- VPC – Benefits and Components
- CIDR Notations
- Network Access Control List v/s Security Groups
- NAT (Network Address Translation): NAT Devices, NAT Gateway and NAT instance
- VPC peering
- Direct Connect
- Private Link
- Classic Link
- AWS CloudWatch
- AWS CloudTrail
- AWS Config
- Trusted Advisor

Hands-On:

- Create a Non-default VPC and attach it to an EC2 instance
- Accessing Internet inside Private Subnet using NAT Gateway
- Connect two instances in different VPC's using VPC peering
- Monitoring Application Metrics Using CloudWatch Dashboard
- Auditing Amazon Cloud Services via AWS CloudTrail
- Explore Trusted Advisor
- Accessing Application within two VPCs (Different Accounts) connected via Private link

Module 8 : Application Services and AWS Lambda

Goal:

In this module, you will learn about different Application services offered by AWS, that are used for sending e-mails, notifications, and processing message queues. This module also deals with the latest trend of Serverless architecture using AWS Lambda.

Objective:

- Implement SES
- Demonstrate the working of SNS
- Work with SQS
- Understand SWF
- AWS Lambda: Working

Topics:

- AWS Simple Email Service (SES)
- AWS Simple Email Service (SES)
- Implement SES
- Demonstrate the working of SNS
- SQS: Work with SQS, ASG with SQS
- Amazon MQ
- Amazon Event Bridge
- AWS Simple Notification Service (SNS)
- AWS Simple Work Flow (SWF)
- AWS Lambda
- AWS Serverless Application Model

Hands-On:

- Send an Email(SES) on addition of user data(Lambda) in the DynamoDB Table.
- Monitor status of EC2 instance using combination of EventBridge and SNS.
- Manage tightly coupled architecture using Amazon SQS.
- Create workflows using AWS Step Functions to coordinate application logic across distributed systems.

Module 9 : Configuration Management and Automation

Goal:

This module helps you gain knowledge on various AWS services and tools used for configuration management and Automation.

Objective:

- Implement CloudFormation
- Work with AWS OpsWorks services
- Understand AWS OpsWorks for Chef Automate, Stack and Puppet Enterprises
- Demonstrate Beanstalk
- Differentiate between CloudFormation, OpsWorks and Beanstalk

Topics:

- Infrastructure as Code
- CloudFormation and its components
- Templates in CloudFormation
- Stack in CloudFormation
- Resource deletion policies in CloudFormation
- Introduction to AWS OpsWorks
- AWS OpsWorks services
- Components of AWS OpsWorks Stack
- OpsWorks Lifecycle Events and Deployment Commands
- OpsWorks for Chef Automate
- AWS OpsWorks for Puppet Enterprise
- Auto Healing
- Elastic Beanstalk
- Components of Elastic Beanstalk

- Beanstalk v/s OpsWorks v/s CloudFormation

Hands-On:

- Installation of LAMP server in EC2 through CloudFormation
- AWS OpsWorks Stack
- Deploy a Web Application with DynamoDB using Beanstalk

Module 10 : Migration to AWS

Goal:

This module helps you to understand how to Migrate Applications and resources to AWS Cloud environment using AWS Migrating Strategies, AWS Database Migration service, and AWS Server migration service.

Objective:

- Understand the need for Cloud Migration
- Figure out the benefits of opting AWS for Cloud Migration
- Plan Migration
- Select appropriate migration strategy as per business necessities
- Understand CAF Perspectives
- Track Migration using AWS Migration Hub
- Discover on-premises data using AWS Application Discovery
- Perform server migration using AWS SMS
- Plan and implement Database Migration

Topics:

- Why Cloud Migration
- What is Cloud Migration
- Migration Phases
- CAF Perspectives and their Roles
- AWS Migration Hub and ways to use AWS Migration Hub
- Roles and Permissions for AWS Migration Hub
- AWS Migration Hub use cases
- AWS Application Discovery Service
- Application Discovery Tools
- Application Migration to AWS

- Application Migration Phases
- Virtual Machines migration ways
- AWS Server Migration Service(SMS) and its working
- Database Migration Implementation steps
- Working of DMS
- AWS Database Migration use cases
- Types of data transfer: Homogenous and Heterogenous
- Database Schema Migration tool
- Database Migration best practices

Hands-On

- Gather Details of Migrating Resource via Application Discovery Service and track the migration via AWS Migration Hub.
- Migrating 3-tier Application to AWS Cloud
- Homogenous Database Migration
- Heterogeneous Database Migration

Module 11 : AWS Architectural Designs – I (Self-Paced)

Learning Objective:

This module gives you an idea of the importance of AWS guidelines for Well Architected Framework. You will also learn about the Resilient and Performant architecture designs.

Objective:

- Design Resilient Architecture in AWS
- Design Highly Available and/or Fault-Tolerant Architectures
- Design Decoupling Mechanisms using AWS Services
- Choose Appropriate Resilient Storage
- Design Multi-Tier Architecture in AWS
- Design High-Performance Architecture in AWS

Topics:

- AWS Well-Architected Framework
- How to Build Well Architected Framework

- Pillars of AWS Well-Architected Framework
- Resilience
- Design Highly Available and/or Fault-Tolerant Architectures
- Choose Appropriate Resilient Storage
- Designing Decoupling Mechanisms Using AWS Services
- Design a Multi-tier Architecture Solution
- Disaster Recovery (DR)
- Options to Implement DR Plans
- Design High-Performance Architecture
- Achieve Performance Efficiency using Selection
- Achieve Performance Efficiency using Review
- Achieve Performance Efficiency by Monitoring
- Achieve Performance Efficiency by Performing Trade-offs

Hands-On

- Designing a Website using Serverless Architecture

Module 12 : AWS Architectural Designs – II (Self-Paced)

Goal:

Adding to Module 10, this module covers the remaining three concepts behind AWS Well-Architected Framework – Securing Applications and Architectures and Designing Cost-Optimized Architectures, Defining Operationally Excellent Architectures.

Objective:

- Secure Applications and Architectures
- Design Cost-Optimized Architectures
- Refer and Understand the White Papers

Topics:

- Design Secure Applications and Architectures
- Cloud Security
- IAM
- How IAM Secures your Resources
- Identity and Federation
- Shared Responsibility Model
- Shared Responsibility Model for Infrastructure Services

- Shared Responsibility Model for Container Services
- Shared Responsibility Model for Abstraction Services
- Network Security Layer
- Multi-Layer Architecture With Network Security
- AWS HSM and its working
- AWS S3 Security
- AWS Security and Compliance Centre
- Design Cost-Optimized Architectures
- Cost Optimization
- Cost Optimization Design Principles
- Cost Effective Resources

Module 13: AWS Certified Solutions Architect Exam Questionnaires (Self-Paced)

Goal:

This module mainly contains exam questionnaires that will be discussed along with the guidance on taking up AWS Solution Architect Certification Exam.

Objective:

- Understand the process of getting Certified as AWS Solution Architect
- Apply for Certification exam
- Take up AWS Architect Certification Exam after prior preparation

Topics:

- AWS Solution Architect Certification Exam Guide
- Certification Exam Questionnaires

Module 14 : DevOps on Cloud (Additional Content)

Goal:

In this module, you will learn how to implement DevOps tools on AWS.

Objective:

- Gain knowledge on different software release methodologies
- Understand Traditional DevOps features
- Know the benefits of DevOps on Cloud
- Identify different AWS Developer tools
- Commit your files to CodeCommit

- Create a CodePipeline
- Understand the working of CodeBuild
- Deploy your application using CodeDeploy
- Understand working of CodeStar

Topics:

- Different software release methodologies
- DevOps Lifecycle and its Building Blocks
- DevOps and cloud relation
- Different AWS Developer tools
- AWS CodeCommit
- Versioning in S3 vs. CodeCommit
- Working of AWS CodeCommit
- AWS CodePipeline and its working
- Concepts of CodePipeline
- Input and Output Artifacts
- AWS CodeBuild and its working
- AWS CodeDeploy
- Primary Components
- Deployment Workflow: On Lambda Platform and On EC2 Platform
- Application Specification File
- Deployment Types: In-Place Deployment and Blue/Green Deployment
- AWS CodeStar and its working

Hands-On:

- Implement AWS CodeCommit
- Implement AWS CodePipeline

edureka!
Discover Learning

Migrating Applications from on-premise to AWS

masters program

Course Curriculum

About the Course

Edureka's Online Workshop on Migrating application to AWS will help you gain expertise and experience in managing cloud migration without any downtimes. Migrating Applications to AWS (Amazon Web Services) Training will help you become proficient in Migrating Strategies, Migrating Web Applications, Database Migration, Batch Processes, and Backend Processing Pipeline to AWS Cloud using the best migration practices suggested by AWS.

This Workshop focuses on several USE CASES where you will be exposed to experiment the migration of Web Applications, Batch Processes, and Backend Processing Pipeline to the AWS cloud. You will understand the functional capabilities of these on AWS after migration.

These USE CASES are intended to provide some insight into how to migrate to AWS in the real world. The session will be conducted by Industry practitioners, who will train you to leverage AWS services to make the AWS infrastructure scalable, reliable, and highly available.

Course Outline

Module 1 : Introduction to AWS Services

Learning Objective:

In this module, the participants will develop a good overall understanding of AWS Services.

Topics:

- AWS Compute, Storage, networking Services
- AWS EC2 Instance launch Demo
- AWS S3 Demo
- AWS security model and Security Services
- AWS IaaC with Cloud formation

- AWS Auto scaling, Load balancing and Cloud Watch Demo

Hands-On:

- Creating an EC2 instance using AWS Management Console
- Creating an Auto-Scaling group using EC2 dashboard
- Configuring a Load Balancer on EC2 instance
- Configuring a Bucket using AWS S3
- Building a non-default VPC
- Using of IAM services to create users and groups
- Creating a Stack using an AWS CloudFormation template
- Setting up your Billing alert

Module 2 : AWS Migration Strategy

Learning Objective:

In this module, you will learn all the pre-migration practices which are recommended by AWS.

Topics:

- AWS CAF – Cloud Adoption Framework
- 6R Migration Pattern
- AWS Well Architecture Framework

Module 3 : Application Migration to AWS

Learning Objective:

In this module, you will learn how to migrate an on-premise Server or VM to cloud.

Topics:

- Application discovery services
- Server Migration services
- Agent based and agentless server migration service
- Migration on Premises Microsoft Hyper VM to AWS AMI
- Migration on Premises VMware VM to AWS AMI

Hands-On:

- Migrating an on premises VM machine to AWS environment

Module 4 : Database Migration to AWS

Learning Objective:

In this module, you will learn how you can perform all pre, during & post migration activities by using AWS portfolio of DB migration services.

Topics:

- DB Migration challenges
- AWS DB Services
- AWS DB Migration services
- AWS Pre during and post migration task

Hands-On:

- Migrating a source DB, which will be from outside the AWS environment to target AWS RDS Aurora DB in side AWS environment

Module 5 : Data Migration to AWS

Learning Objective:

In this module you will learn how to transfer data to AWS in large scale.

Topics:

- Storage Gateway
- Kinesis Firehose
- Snowball, Snowball edge and Snowball Mobile
- Direct Connect
- S3 Transfer Acceleration

Hands-On:

- Speeding up a large-scale data migration to S3 by enabling S3 Acceleration
- Confirming how much data migration has been speeded up via a tool

Module 6 : Migrating monolithic application to AWS with Docker

Learning Objective:

The goal of this module is to provide you both why and how of docker and AWS elastic container service (ECS) can be used to migrate monolithic application to AWS Cloud.

Topics:

- Understand Docker Ecosystem
- How docker can be used to package a monolithic application inside docker container
- Understanding how ECS works with docker
- Orchestrate a docker container-based system

Hands-On:

- Migrating a monolithic application to AWS and then breaking it into microservices

edureka!
Discover Learning

DevOps Certification Training

masters program

Course Curriculum

About the Course

Edureka's DevOps Training Program will provide you with in-depth knowledge of various DevOps tools including Git, Jenkins, Docker, Ansible, Terraform, Kubernetes, Prometheus, and Grafana. This DevOps Certification training is completely hands-on and designed in a way to help you become a certified practitioner through best practices in Continuous Development, Configuration Management and Continuous Integration, and finally, Continuous Monitoring of software throughout its development life cycle.

Course Outline

Module 1 : Overview of DevOps
Goal: In this module, you will be introduced to the DevOps environment.

Objectives:
After completing this module, you should be able to:

- Understand the benefits of DevOps over other software development processes
- Gain insights into the DevOps environment
- Get an overview of different DevOps Tools
- Get a picture of the working of the DevOps Delivery Pipeline

Topics:

- Introduction to DevOps
- Benefits of working in a DevOps environment
- DevOps Lifecycle
- DevOps Stages
- DevOps Delivery Pipeline

Module 2: Version Control with Git

Goal: In this module, you will gain insights into Source Control Management and learn the functionalities of Git.

Objectives:
After completing this module, you should be able to:

- Understand Version Control
- Perform management of files for small as well as large projects
- Perform various Git commands such as git add, git fetch, git commit, git init, etc.
- Work with remote repositories

Topics:

- Version Control
- Git Introduction
- Git Installation
- Commonly used commands in Git
- Working with Remote repository

Hands-on:

- Git Common Commands
- Working with Remote Repository

Module 3: Git, Jenkins & Maven Integration

Goal: In this module, you will learn about the different actions performed through Git and will be introduced to Jenkins and Maven.

Objectives:
After completing this module, you should be able to:

- Execute branching and merging operations
- Perform various Git commands
- Understand Maven Architecture and dependencies
- Learn about Continuous Integration & its importance
- Understand Jenkins and its features

Topics:

- Branching and merging in Git
- Merge Conflicts
- Stashing, Rebasing, Reverting and Resetting
- Git Workflows

- Introduction to Maven
- Maven Architecture
- Introduction to Continuous Integration
- Introduction to Jenkins

Hands-on:

- Branching and Merging
- Merge Conflicts
- Stashing, Rebasing, Reverting, and Reseting
- Configuring Maven

Module 4: Continuous Integration using Jenkins

Goal: In this module, learn how to perform Continuous Integration by building applications with the help of Maven and create deployment pipelines using Jenkins.

Objectives:

After completing this module, you should be able to:

- Managing authorization in Jenkins
- Jenkins notification management
- Master-slave architecture in Jenkins
- Add a slave node to Jenkins master
- Build and deploy codes using Jenkins
- Build pipeline plugin in Jenkins
- Use Declarative pipeline in Jenkins

Topics:

- Jenkins Architecture
- Plugin Management in Jenkins
- Jenkins Security Management
- Notification in Jenkins
- Jenkins Master-slave architecture
- Jenkins Delivery Pipeline
- Jenkins Declarative pipeline

Hands-on:

- Create pipeline view using DevCompile and QAUnitTest
- Adding Slave node in Jenkins
- Build Pipeline project using Groovy script

Module 5: Configuration Management Using Ansible

Goal: Learn how to manage and configure your infrastructure using Ansible Ad-Hoc commands, Playbooks, and Roles.

Objectives:
After completing this module, you should be able to:

- Utilize Ansible CLI
- Execute Ansible Ad-Hoc Commands for one-off tasks
- Automate host servers using Ansible Playbooks
- Use Variables in Playbooks
- Using Handlers

Topics:

- Introduction to Configuration Management
- Infrastucture as Code
- Introduction to Ansible
- Ansible Architecture
- Inventory Management
- Ansible Modules
- AD-HOC Commands
- Ansible Playbooks
- Ansible Roles

Hands-On:

- Ad-Hoc Commands
- Running a Simple Playbook
- Using Variables and handlers
- Using Ansible Roles

Module 6 : Continuous Deployment: Containerization with Docker

Goal: This module introduces learners to the core concepts and technology behind Docker. Learn in detail about containers and various operations performed on them.

Objectives:
After completing this module, you should be able to:

- Understand Containerization
- Learn the evolution of virtualization to containers

- Understand the Docker Architecture
- Perform Various actions using Docker CLI
- Bind container ports to the Machine ports
- Run containers in different modes
- Write and build a Dockerfile to create a Docker Image

Topics:

- Containerization
- Namsepaces
- Docker
- Docker Architecture
- Container Lifecycle
- Docker CLI
- Port Binding
- Detached and Foreground Mode
- Dockerfile
- Dockerfile Instructions
- Docker Image

Hands-on:

- Docker CLI Commands
- Port Binding
- Starting Containers in Different Modes
- Writing a Dockerfile to Create an Image

Module 7 : Containerization using Docker Part – II

Goal: Learn how to use Docker Hub registry, deploy a multi-tier application using Docker Compose, and create a swarm cluster.

Objectives:

After completing this module, you should be able to:

- Use Docker Hub to store custom Images
- Store data in Container Volumes for persistent storage
- Setup Docker Compose
- Deploy a multi-container application using Docker Compose
- Deploy a Swarm Cluster

Topics:

- Docker Registry
- Container Storage
- Volumes
- Docker Compose
- Docker Swarm

Hands-on:

- Setting up Docker Hub
- Docker Volumes
- Installing Docker Compose
- Installing a Multi-Container Application using Compose
- Running Docker in Swarm Mode

Module 8: Orchestration using Kubernetes Part - I

Goal: In this module, you will learn about Container Orchestration and Basic of container management using Kubernetes.

Objectives:

After completing this module, you should be able to:

- Understand Container Orchestration
- Learn about Kubernetes Core Concept
- Deploy Pods
- Create Deployments to manage Pods
- Launch DaemonSets for Background applications
- Update and Rollback your Deployments
- Scale your containerized Applications

Topics:

- Introduction to Container Orchestration
- Kubernetes Core Concepts
- Understanding Pods
- ReplicaSet and Replication Controller
- Deployments
- DaemonSets
- Rolling Updates and Rollbacks
- Scaling Application

Hands-on:

- Kubectl Common Commands
- Deployments
- DaemonSets
- Rolling-update and Rollbacks
- Scaling in Kubernetes

Module 9: Orchestration using Kubernetes Part – II

Goal: Learn and deploy different service discovery mechanisms, utilize Volumes for persistent storage and deploy StatefulSets for stateful applications.

Objectives:

After completing this module, you should be able to:

- Deploy different Kubernetes Services
- Utilize Volumes to store Persistent Data
- Create Persistent Volume Claims to attach volumes to Pods
- Understand Persistent Volume Claims Primitives
- Use Headless Services in Stateful Sets
- Deploy Helm Charts

Topics:

- Services
- Persistent Storage in Kubernetes
- Primitives for PersistentVolumeClaims
- Secrets and ConfigMaps
- Headless Services
- StatefulSets
- Helm Charts

Hands-on:

- Deploying Services
- Persistent Volumes and Persistent Volume Claims
- StatefulSets
- ConfigMaps and Secrets
- Helm Charts

Module 10: Monitoring using Prometheus and Grafana

Goal: In this module, you will learn how to collect, monitor, and visualize data using Prometheus and Grafana.

Objectives:

After completing this module, you should be able to:

- Understand Continuous Monitoring
- Use Prometheus to monitor services
- Create an alerting mechanism using Prometheus
- Deploy Grafana dashboards to visualize data
- Integrate Prometheus and Grafana to monitor a full pipeline

Topics:

- Introduction to Prometheus and Grafana
- Prometheus and Grafana Setup
- Monitoring using Prometheus
- Dashboard Visualization using Grafana
- Creating a Dashboard to monitor the Pipeline

Hands-on:

- Monitoring Service using Prometheus
- Alerting using Prometheus
- Grafana Dashboards
- Monitoring a Pipeline

Module 11: Provisioning using Terraform Part - I

Goal: Learn how to provision and manage infrastructure on a Cloud Platform (AWS) using Terraform Configuration Files.

Objectives:

After completing this module, you should be able to:

- Understand Provisioning using Terraform
- Learn the Difference between Terraform vs Ansible
- Understand Terraform Architecture
- Deploy a Terraform Configuration File
- Use Basic Terraform Commands

- Manage Terraform Resources

Topics:

- Introduction to Terraform
- Terraform vs Ansible
- Terraform Architecture
- Terraform Configuration
- Terraform Common Commands
- Managing Terraform Resources

Hands-on:

- Setting Up AWS and Terraform
- Executing a Terraform Configuration
- Managing Terraform Resources
- Referencing Terraform Resources

Module 12: Provisioning using Terraform Part – II

Goal: Use Terraform State commands to manage the current state of your infrastructure. Deploy a fully usable and working infrastructure using Terraform.

Objectives:

After completing this module, you should be able to:

- Perform Terraform State Commands
- Deploy a Terraform Project on AWS

Topics:

- Terraform State
- Terraform Project

Hands-on:

- Terraform State Commands
- Terraform Project

Module 13: Selenium

Goal: Use In this module, you will learn about selenium and how to automate your test cases for testing web elements. You will also get introduced to X-Path, TestNG and integrate Selenium with Jenkins.

Objectives:

After completing this module, you should be able to:

- Learn and install Selenium
- Create Test Cases in Selenium WebDriver
- Utilize X-Path and TestNG to locate elements
- Execute code on several browsers using Selenium suite of tools
- Integrate Selenium with Jenkins

Topics:

- Introduction to Selenium
- Why Selenium?
- Selenium – Webdriver
- Creating Test Cases in Selenium WebDriver (Waits)
- What and why X-Path
- Handling different controls on Webpage
- Framework in Selenium
- Selenium Integration with Jenkins
- Implementation of Selenium in the Edureka's Project

Hands-on:

- Installing Selenium
- Creating Test Cases in Selenium WebDriver
- Integrating Selenium with Jenkins

Module 14: Nagios

Goal: Learn how to continuously monitor your tasks using various plugins and implementing Nagios Commands

Objectives:

After completing this module, you should be able to:

- Operate Continuous Monitoring tools
- Use various plugins and objects associated with Nagios
- Implement Nagios commands

Topics:

- Introduction to Continuous Monitoring
- Introduction to Nagios
- Installing Nagios
- Nagios Plugins(NRPE) and Objects

- Nagios Commands and Notification

Hands-on:

- Installing Nagios
- Monitoring of different servers using Nagios

Module 15: DevOps on Cloud

Goal: Learn about various cloud services and service providers, also get the brief idea of how to implement DevOps using AWS.

Objectives:

After completing this module, you should be able to:

- Understand about cloud and its advantages
- Learn about Various cloud computing services
- Get an idea of how to implement DevOps using AWS

Topics:

- Why Cloud?
- Introduction to Cloud Computing
- Why DevOps on Cloud?
- Introduction to AWS
- Various AWS services
- DevOps using AWS

Module 16: AWS EC2 and IAM

Goal: Get a brief idea of how Security and EC2 Compute service works in AWS Cloud.

Objectives:

After completing this module, you should be able to:

- Describe AWS Global Infrastructure and its Benefits
- Sign-up an AWS free-tier account
- Work with AWS Management Console and AWS CLI
- Work with IAM Service
- Understand Virtualization
- Work with EC2
- Analyze various EC2 box configurations available

Topics:

- Virtualization
- Amazon Web Services (AWS)
- Benefits of AWS
- AWS Global Infrastructure
- AWS: IAM
- Components of IAM
- Managing users with IAM
- Amazon Machine Image (AMI)
- Security Groups in AWS
- Virtualization
- Amazon Elastic Compute Cloud (EC2) and Its Benefits
- Networking components associated with EC2
- Instance Store

Hands-on:

- Signing up for a Free Tier Account with AWS
- Creating New User to Log in to AWS Management Console
- Creating Policies for New User to Have All Admin or Limited Privileges
- Different Approaches to connect to an EC2 instance
- Creating a Custom AMI
- Host your Website Inside your EC2 Instance
- To Attach EFS Volume to an EC2 Instance
- Login to AWS Console via MFA

edureka!
Discover Learning

AWS Certified DevOps

masters program

Course Curriculum

About the Course

The AWS Certified DevOps Engineer – Professional exam validates technical expertise in provisioning, operating and managing distributed application systems on the AWS platform. Edureka's AWS Certified DevOps Engineer training has been designed to help an individual in developing advanced technical skills on CodeCommit, Codepipeline, CloudFormation, OpsWorks, Beanstalk and many more, needed to successfully attempt the AWS Certified DevOps Engineer – Professional examination. With this AWS professional certification under your belt, you will join an elite club of AWS Certified DevOps Engineer Professionals who are in high demand by employers worldwide.

Course Outline

Module 1 : Introduction to DevOps on Cloud

Learning Objective:

In this module, you will be introduced to important aspects of DevOps and Amazon Web Services. Also, you will get to know about the necessary security concepts required to manage your account and data on the AWS platform.

Topics:

- Understanding DevOps and its lifecycle
- Why DevOps on Cloud?
- Introduction to AWS
- DevOps using AWS
- Security Management - IAM (Identity and Access Management), WAF (Web Application Firewall), AWS Shield, Guard Duty
- Trusted Advisor

- Governance Strategies

Hands-On:

- Creating Policies for a new user to have all Admin Or Limited Privileges
- Login AWS Management Console via MFA
- Trusted Advisor
- Enabling Governance using AWS Config
- Set Alerts and Budget for your AWS Account

Module 2 : SDLC Automation

Learning Objective:

In this module, you will learn how to automate Software Development Lifecycle using various AWS development tools.

Topics:

- CodeCommit
- CodeBuild
- CodePipeline
- CodeDeploy
- AWS CodeStar

Hands-On:

- Working of Code Commit
- Deploy an application using Codepipeline

Module 3 : Automating Infrastructure with CloudFormation

Learning Objective:

In this module, you will be introduced to important aspects of CloudFormation. Along with it, you will also learn how to use CloudFormation Templates to model and provision the AWS resources in an automated and secure manner for your application.

Topics:

- Introduction to CloudFormation
- CloudFormation Template
- Intrinsic Functions & Conditions
- Stack Creation

- Advanced CloudFormation Concepts - CloudFormation Nesting, CloudFormation Wait Conditions & Wait Condition Handlers, CloudFormation Helper Scripts, CloudFormation Custom Resources
- CloudFormation Stack Updates
- CloudFormation Resource Deletion Policy
- CloudFormation Best Practices
- Troubleshooting

Hands-On:

- Creating an S3 Bucket using CloudFormation by Hardcoding the Name
- Creating an S3 Bucket using Intrinsic Function (Join And Ref)
- Creating and Configuring EC2 Instance using Helper Scripts
- Creating a Custom Resource with the help of Lambda Function

Module 4 : Application Deployment using Elastic Beanstalk

Learning Objective:

In this module, you will learn various aspects of Elastic Beanstalk. Also, you will learn how to deploy and Monitor your application in Beanstalk.

Topics:

- Introduction to Elastic Beanstalk
- Components of Beanstalk
- Deployment Option
- Platform Updates
- Docker in Elastic Beanstalk
- Extending Beanstalk using extensions
- Alarms and Notification
- Troubleshooting

Hands-On:

- Deploy a Web application with DynamoDB using Beanstalk
- Deploy an application in beanstalk using Docker
- Immutable deployment of the application in Beanstalk
- Creating cron-job on beanstalk instances using .ebextensions

Module 5 : Configuration Management using OpsWorks

Learning Objective:

In this module, you will get to know the nitty-gritty of AWS OpsWorks and learn how to create stacks and manage configuration with AWS OpsWorks.

Topics:

- Introduction to OpsWorks
- Components of OpsWorks
- Cookbooks, Recipes, Data bags and Berkshelf
- OpsWorks Lifecycle Events
- OpsWorks Deployment
- OpsWorks Auto-Healing
- Troubleshooting

Hands-On:

- Deploy an application in OpsWorks Stack
- Integration of CloudFormation with OpsWorks

Module 6 : Automate Monitoring and Event Management in AWS

Learning Objective:

In this module, you will understand how to implement the concepts of continuous monitoring and management using CloudWatch and CloudTrail. You will also learn to set-up event-driven automated actions.

Topics:

- Introduction to CloudWatch
- CloudWatch Metrics: EC2, ELB, and Auto Scaling metrics
- Custom Metrics
- CloudWatch Alarms
- CloudWatch Agent
- CloudWatch Logs
- Introduction to CloudTrail
- System Manager
- Tagging
- Concepts required to set-up event-driven automated actions - Lambda, SNS, Autoscaling

Hands-On:

- Configure Amazon CloudWatch to Notify when CPU Utilization of an Instance is greater than 85%

- Enable CloudTrail and store Logs in S3

Module 7 : High Availability, Fault Tolerance and Disaster Recovery

Learning Objective:

In this module, you will learn how to implement highly available and fault-tolerant systems. Also, you will be introduced to Disaster recovery strategies which are effective in making your system resilient at any point of failure.

Topics:

- EBS
- Elastic IP
- Multi region and multi AZs
- SQS
- Data Management in Amazon RDS
- Dynamo DB
- S3
- Provisioning elasticity using Load Balancer and Auto-Scaling
- Components of Auto Scaling
- Horizontal and vertical scaling
- Auto-Scaling Lifecycle
- Recovery Time Objective and Recovery Point Objective
- Disaster Recovery Options
- Overcome single Point of Failure

Hands-On:

- Working of Load Balancer and Auto-Scaling to support highly available and fault tolerant system

Module 8 : Container Management Tools

Learning Objective:

In this module, you will learn about container management tools like Elastic Container Registry (ECR), Elastic Container Service (ECS) and Fargate.

Topics:

- ECS Task Definition
- ECS Networking Modes
- Placement strategy

- Memory reservation
- CPU reservation
- ECS agent
- ECS and Load balancing (ALB)
- Service autoscaling
- .ed•urekSae.crovice discovery in ECS
- ECR
- Fargate

Hands-On:

- Deploy an application in ECS
- Deploy an application in ECS using ECR

Module 9 : AWS Certified DevOps Engineer Exam Discussion(Self-Paced)

Learning Objective:

This module focuses on exam questionnaires along with guidance on preparing for the AWS Certified DevOps Engineer Exam.

Topics:

- AWS Certified DevOps Engineer Exam Guide
- Certification Exam Questionnaire