AWS Course Content (Zero to Advanced)

Course Overview

Title: Amazon Web Services (AWS) – Cloud Computing from Zero to Advanced
Level: Beginner → Advanced
Duration: 40–50 Hours
Outcome:
Design, deploy, secure, and operate **highly available, scalable, and production-ready AWS infrastructure**.

Learning Outcomes

By the end of this course, you will be able to:

- Understand core AWS services and global infrastructure
- Design fault-tolerant architectures
- Secure AWS environments using IAM & best practices
- Deploy real-world applications on AWS
- Automate infrastructure using Terraform & CI/CD
- Prepare for AWS certifications & interviews

Module 1: Cloud Computing Fundamentals

Objective: Understand cloud basics and AWS advantages

Topics

- What is Cloud Computing?
- On-Prem vs Cloud
- Cloud Service Models: IaaS, PaaS, SaaS
- Cloud Deployment Models: Public, Private, Hybrid
- AWS Shared Responsibility Model
- AWS Global Infrastructure:
    - Regions

    - Availability Zones
    - Edge Locations

Hands-On

- Create AWS Free Tier account
- Explore AWS Management Console

Module 2: AWS Identity & Access Management (IAM)

Objective: Secure AWS access properly

Topics

- IAM Users, Groups, Roles
- Policies (Managed vs Inline)
- Role-based access
- MFA & best practices
- IAM vs Resource-based policies

Hands-On

- Create IAM user & role
- Attach least-privilege policies
- Enable MFA

Module 3: Compute Services

Objective: Run applications on AWS

Topics

- EC2 fundamentals
- Instance types & pricing models
- AMI, Key pairs, Security Groups
- Elastic Load Balancer (ALB/NLB)
- Auto Scaling Groups

- AWS Lambda (Serverless basics)

Hands-On

- Launch EC2 instance
- Configure ALB + ASG
- Create basic Lambda function

Module 4: Networking in AWS (VPC)

Objective: Build secure AWS networks

Topics

- VPC fundamentals
- CIDR, Subnets (Public/Private)
- Route Tables
- Internet Gateway & NAT Gateway
- Security Groups vs NACL
- VPC Peering & Endpoints

Hands-On

- Create custom VPC
- Configure public & private subnets
- Setup NAT Gateway

Module 5: Storage Services

Objective: Store and manage data effectively

Topics

- Amazon S3:
    - Buckets, objects, storage classes
    - Versioning & lifecycle policies

- EBS:
    - Volume types

    - Snapshots
- EFS: Use cases & performance modes

Hands-On

- Create S3 bucket with lifecycle rules
- Attach EBS volume to EC2
- Mount EFS on EC2

Module 6: Database Services

Objective: Use managed databases on AWS

Topics

- RDS (MySQL, PostgreSQL)
- Multi-AZ vs Read Replicas
- Amazon DynamoDB
- Amazon Aurora
- Backup & restore strategies

Hands-On

- Launch RDS instance
- Configure read replica
- Create DynamoDB table

Module 7: High Availability & Scalability

Objective: Design resilient architectures

Topics

- Fault tolerance
- High availability patterns
- Multi-AZ & Multi-Region design
- Load balancing strategies
- Disaster recovery strategies:

    - Backup & Restore
    - Pilot Light
    - Warm Standby
    - Multi-Site

Hands-On

- Deploy multi-AZ application
- Simulate instance failure

Module 8: Security & Compliance

Objective: Secure AWS environments

Topics

- IAM best practices
- AWS KMS (Encryption)
- AWS Secrets Manager
- AWS SSM Parameter Store
- AWS WAF & Shield
- CloudTrail & Config

Hands-On

- Encrypt S3 with KMS

- Store secrets securely
- Enable CloudTrail logging

Module 9: Monitoring & Logging

Objective: Monitor AWS resources

Topics

- Amazon CloudWatch: Metrics, Logs, Alarms
- AWS X-Ray

- Centralized logging strategy

Hands-On

- Create CloudWatch alarms
- Monitor EC2 & RDS metrics

🧩 Module 10: Containers & Orchestration

Objective: Run containerized workloads

Topics

- Docker basics
- Amazon ECS
- AWS Fargate
- Amazon EKS overview
- Load balancing containers

Hands-On

- Deploy container on ECS Fargate
- Setup ALB for ECS service

Module 11: Infrastructure Automation

Objective: Automate AWS infrastructure

Topics

- AWS CloudFormation basics
- Terraform with AWS
- IaC best practices
- Environment management

Hands-On

- Deploy VPC using Terraform
- Manage state remotely

🧩 Module 12: CI/CD on AWS

Objective: Automate application delivery

Topics

- CI/CD concepts
- GitHub Actions with AWS

Hands-On

- Build CI/CD pipeline
- Deploy app automatically to EC2 / ECS

Module 13: Cost Management & Optimization

Objective: Control AWS spending

Topics

- AWS pricing models
- Cost Explorer
- Budgets & alerts
- Rightsizing resources
- Savings Plans & Reserved Instances

Hands-On

- Create AWS budget
- Analyze cost reports

🧩 Module 14: Troubleshooting & Operations

Objective: Operate AWS in production

Topics

- Common AWS issues
- Networking troubleshooting
- IAM permission errors
- Service limits & quotas
- AWS support plans

Hands-On

- Debug access denied errors
- Fix networking issues

Module 15: Advanced AWS Concepts

Objective: Prepare for real-world & interviews

Topics

- Multi-account strategy
- AWS Organizations
- Control Tower
- Landing zones
- Hybrid connectivity
- AWS vs Azure vs GCP

🧩 Module 16: Capstone Project

Objective: Apply everything learned

Project: Production-Ready AWS Architecture

- Custom VPC
- ALB + Auto Scaling
- RDS (Multi-AZ)
- Secure IAM setup
- Monitoring & logging
- Terraform automation
- CI/CD pipeline