Cloud Computing (AWS)

Course Duration

- **Total Hours:** 60–80 Hours
- **Theory:** 40%
- **Practical / Hands-on:** 60%

Prerequisites

- Basic Computer Knowledge
- Fundamentals of Networking
- Basic Linux / Windows OS concepts
- (Optional) Basic Programming knowledge

Module 1: Introduction to Cloud Computing (6 Hours)

Topics:

- What is Cloud Computing?
- Evolution of Computing (Mainframe → Client-Server → Cloud)
- Cloud Service Models
  - IaaS
  - PaaS
  - SaaS
- Cloud Deployment Models
  - Public Cloud
  - Private Cloud
  - Hybrid Cloud
  - Multi-Cloud
- Benefits and Challenges of Cloud Computing
- Use Cases of Cloud in Industry

Module 2: Introduction to Amazon Web Services (AWS) (6 Hours)

Topics:

- What is AWS?
- AWS Global Infrastructure
  - Regions
  - Availability Zones
  - Edge Locations
- AWS Shared Responsibility Model
- AWS Pricing Models
  - On-Demand
  - Reserved
  - Spot Instances
- AWS Free Tier

- Creating an AWS Account
- AWS Management Console Overview

Module 3: Identity and Access Management (IAM) (6 Hours)

Topics:

- What is IAM?
- Users, Groups, Roles
- IAM Policies (JSON structure)
- Managed vs Inline Policies
- MFA (Multi-Factor Authentication)
- Best Practices for IAM Security
- Hands-on:
  - Create Users and Groups
  - Assign Policies
  - Enable MFA

Module 4: AWS Compute Services (EC2) (10 Hours)

Topics:

- Introduction to EC2
- EC2 Instance Types
- AMI (Amazon Machine Image)
- Key Pairs and Security Groups
- Elastic IP
- EC2 Instance Lifecycle
- Connecting to EC2 (SSH / RDP)
- Auto Scaling Overview
- Elastic Load Balancer (ELB) Basics
- Hands-on:
  - Launch EC2 Instance
  - Host a Website on EC2
  - Configure Security Groups

Module 5: AWS Storage Services (10 Hours)

Topics:

- Amazon S3 (Simple Storage Service)
  - Buckets and Objects
  - Storage Classes
  - Versioning
  - Lifecycle Policies
- Amazon EBS (Elastic Block Store)
- Amazon EFS (Elastic File System)
- Amazon S3 Glacier
- Hands-on:
  - Create S3 Bucket

- Upload / Download Objects
- Apply Lifecycle Rules
- Attach EBS to EC2

Module 6: AWS Networking (VPC) (10 Hours)

Topics:

- Introduction to Amazon VPC
- CIDR Blocks
- Subnets (Public & Private)
- Internet Gateway
- NAT Gateway
- Route Tables
- Security Groups vs NACL
- VPC Peering (Overview)
- Hands-on:
  - Create VPC
  - Launch EC2 in Public Subnet
  - Configure Internet Access

Module 7: AWS Database Services (8 Hours)

Topics:

- Introduction to AWS Databases
- RDS (Relational Database Service)
  - MySQL
  - PostgreSQL
  - Oracle
- DynamoDB (NoSQL)
- Backup and Restore
- Multi-AZ Deployment
- Hands-on:
  - Create RDS Instance
  - Connect RDS with EC2

Module 8: Security, Monitoring & Management (8 Hours)

Topics:

- AWS Security Best Practices
- AWS CloudWatch
- AWS CloudTrail
- AWS Config (Overview)
- Cost Management and Billing
- AWS Budgets
- Hands-on:
  - Monitor EC2 with CloudWatch
  - View Logs and Metrics

Module 9: DevOps & Automation Basics (Optional / Advanced) (6 Hours)

Topics:

- Introduction to DevOps on AWS
- AWS Elastic Beanstalk
- AWS Lambda (Serverless Overview)
- Infrastructure as Code (CloudFormation Overview)
- CI/CD Overview using AWS Tools

Module 10: Mini Project & Case Studies (10 Hours)

Project Ideas:

- Host a Static Website using S3
- Deploy Web Application using EC2 + RDS
- Create Secure VPC Architecture
- Cost Optimization Case Study

Learning Outcomes

After completing this course, students will be able to:

- Understand cloud computing concepts
- Deploy and manage AWS services
- Design secure and scalable cloud infrastructure
- Monitor, optimize, and secure cloud resources
- Prepare for **AWS Cloud Practitioner / Solutions Architect (Associate)**