



# AWS Cloud Administrator with GenAI

**Duration:** 3 Months

**Training Hours:** 96 Hours (8 Hours/Week)

**Month 1:** AWS Cloud Foundations & Networking

## Week 1 – AWS Cloud Fundamentals & Account Setup

### Module 1: Introduction to AWS Cloud Computing

#### What You'll Learn

Build a strong foundation in cloud computing by understanding AWS services, cloud deployment models, pricing concepts, and how Generative AI can simplify cloud administration and automation.

#### Topics Covered

- Introduction to Cloud Computing
- What is Amazon Web Services (AWS)?
- Benefits of AWS Cloud
- AWS Global Infrastructure
- AWS Regions & Availability Zones
- Pay-As-You-Go Pricing Model
- IaaS, PaaS & SaaS
- AWS Free Tier Benefits
- Overview of EC2
- Load Balancer Fundamentals
- Auto Scaling Basics
- Introduction to Identity & Access Management (IAM)
- Introduction to AWS CLI
- Using GenAI Tools for Cloud Automation

## **Practical Labs**

- Create AWS Free Tier Account
- Configure Billing Dashboard
- Enable Multi-Factor Authentication (MFA)
- Configure Budget Alerts
- Explore AWS Management Console

# **Week 2 – Identity Management & AWS Networking Fundamentals**

## **Module 2: AWS Identity & VPC Fundamentals**

### **What You'll Learn**

Learn how AWS secures cloud environments using IAM while building a strong understanding of Virtual Private Cloud (VPC), subnetting, and network design using both the AWS Console and AWS CLI with GenAI assistance.

### **Topics Covered**

- What is Generative AI?
- Importance of GenAI in Cloud Administration
- IAM Users
- IAM Groups
- IAM Permissions
- AWS IAM Best Practices
- AWS CLI for IAM Administration
- Generate IAM Reports using AWS CLI & GenAI
- Introduction to Virtual Private Cloud (VPC)
- CIDR Block Concepts
- Public & Private Subnets
- AWS Default VPC
- Subnet Planning
- Creating Subnets using AWS Console
- Creating Subnets using AWS CLI with GenAI

## **Practical Labs**

- Create IAM Users & Groups
- Assign Permissions

- Create Custom VPC
- Create Public & Private Subnets
- Automate Subnet Creation using AWS CLI

## **Week 3 – AWS Networking & Security**

### **Module 3: Building Secure AWS Networks**

#### **What You'll Learn**

Understand how AWS networking works by configuring Internet Gateways, Route Tables, Security Groups, Network ACLs, VPN connectivity, and Direct Connect to build secure and scalable cloud infrastructures.

#### **Topics Covered**

- Default VPC
- Custom VPC
- Internet Gateway (IGW)
- Implied Router
- Route Tables
- Route Table Association
- Security Groups
- Network ACL (NACL)
- Security Group vs NACL
- Virtual Private Gateway (VPG)
- VPN Connectivity
- AWS Direct Connect
- Route Table Deep Dive
- Security Group Best Practices
- NACL Rules & Processing

#### **Practical Labs**

- Create Custom VPC
- Attach Internet Gateway
- Configure Route Tables
- Configure Security Groups
- Configure NACL Rules
- Test Secure Connectivity

- Configure Resources using AWS CLI & GenAI

## **Week 4 – Amazon EC2 Administration**

### **Module 4: Deploying & Managing EC2 Instances**

#### **What You'll Learn**

Deploy and administer Windows and Linux virtual machines on AWS while understanding storage, authentication, networking, and remote administration techniques.

#### **Topics Covered**

- EC2 Instance Families
- Amazon Machine Images (AMI)
- Windows EC2 Deployment
- Linux EC2 Deployment
- Key Pair Creation
- PEM & PPK Keys
- Windows Authentication
- Linux Authentication
- EC2 Instance Connect
- SSH using PuTTY
- Remote Desktop Protocol (RDP)
- Understanding Stateful & Stateless Firewalls
- Testing Security Groups
- Testing NACL
- Reset Windows Password
- Disable Firewall using PowerShell

#### **Practical Labs**

- Launch Windows Server EC2
- Launch Linux EC2
- Connect using SSH & RDP
- Configure Key Authentication
- Test Security Group Rules
- Test NACL Rules
- Manage EC2 Access Securely

## **Skills Gained After Month 1**

By the end of Month 1, learners will be able to:

- Understand AWS global infrastructure.
- Configure AWS accounts securely.
- Manage IAM users, groups, and permissions.
- Design and deploy Virtual Private Clouds (VPCs).
- Configure secure networking using Security Groups and NACLs.
- Deploy and manage Windows and Linux EC2 instances.
- Use AWS CLI with GenAI to automate cloud administration tasks.
- Implement AWS security best practices for production-ready environments.

## **MONTH 2 – AWS Compute, Storage & High Availability**

### **Week 5 – Hybrid Cloud & Advanced VPC**

#### **Module 5: Hybrid Networking & Enterprise Connectivity**

##### **What You'll Learn**

Learn how to connect AWS with on-premises environments by implementing hybrid cloud architectures, VPC peering, NAT Gateway, Bastion Hosts, and Microsoft Active Directory integration.

##### **Topics Covered**

- VPC Peering
- Cross-Region VPC Peering
- VPN vs Direct Connect
- Microsoft Active Directory Installation
- AD Connector
- IAM Roles

- Hybrid Cloud Authentication
- IAM Role Assignment
- Automated VPC Peering using AWS CLI & GenAI
- NAT Gateway
- Route Table Updates
- Bastion Host (Jump Server)
- VPC Endpoints
- EC2 Instance Connect Endpoint

## **Practical Labs**

- Configure Cross-Region VPC Peering
- Configure AD Connector
- Test Hybrid Authentication
- Deploy NAT Gateway
- Configure Bastion Host
- Create VPC Endpoint
- Automate Networking using AWS CLI & GenAI

# **Week 6 – EC2 Administration & Cost Optimization**

## **Module 6: Advanced EC2 Management**

### **What You'll Learn**

Master EC2 administration, storage management, pricing models, monitoring, and optimization techniques to manage production cloud workloads efficiently.

### **Topics Covered**

- AWS Systems Manager (SSM)
- SSM Agent
- Fleet Manager
- Session Manager
- EC2 Billing Models
- Billing Dashboard
- On-Demand Instances
- EC2 States (Start, Stop, Reboot, Hibernate)
- Elastic IP
- Instance Type Modification

- Termination Protection
- Amazon EBS
- EBS Volume Types
- EBS Pricing
- Hot Add Storage
- Volume Expansion
- EBS Modification
- Cost Optimization
- Savings Plans
- Spot Instances

## **Practical Labs**

- Enable Systems Manager
- Create EC2 using AWS CLI & GenAI
- Manage EC2 without SSH/RDP
- Resize EC2 Instances
- Extend EBS Volumes
- Configure Elastic IP
- Perform Cost Optimization Analysis

# **Week 7 – Backup, Storage & Monitoring**

## **Module 7: Data Protection & Storage Management**

### **What You'll Learn**

Implement enterprise-grade storage management, backup strategies, encryption, monitoring, and application availability using AWS services.

### **Topics Covered**

- EBS Snapshots
- Snapshot Scheduling
- Snapshot Sharing
- Snapshot Migration
- Cross-Region Snapshot Copy
- Snapshot Encryption
- EBS Encryption
- AWS Key Management Service (KMS)

- Customer Managed Keys
- EC2 User Data
- Amazon Machine Image (AMI)
- Application Load Balancer
- Target Groups
- CloudWatch
- CloudWatch Alarms
- Simple Notification Service (SNS)

## **Practical Labs**

- Create Backup Strategy
- Configure Snapshot Lifecycle
- Encrypt Volumes
- Deploy Load Balancer
- Configure CloudWatch Monitoring
- Configure SNS Email Alerts

# **Week 8 – Auto Scaling & Amazon S3**

## **Module 8: High Availability & Object Storage**

### **What You'll Learn**

Build scalable cloud applications using Auto Scaling, Launch Templates, Amazon S3, CloudFront, and website hosting.

### **Topics Covered**

- Auto Scaling
- Launch Templates
- Dynamic Scaling Policies
- Scaling Events
- Load Balancer Integration
- Monitoring Auto Scaling
- Amazon S3
- Bucket Creation
- AWS CLI with GenAI
- Bucket Versioning
- Cross-Region Replication

- Static Website Hosting
- Amazon CloudFront
- CDN Performance Optimization

## **Practical Labs**

- Configure Auto Scaling Group
- Create Launch Templates
- Deploy Highly Available Web Application
- Configure S3 Website Hosting
- Enable Versioning
- Configure Cross-Region Replication
- Configure CloudFront Distribution

## **Skills Gained After Month 2**

Students will be able to:

- Build hybrid cloud environments.
- Configure enterprise networking.
- Manage EC2 infrastructure efficiently.
- Implement backup and disaster recovery.
- Optimize AWS costs.
- Deploy scalable applications.
- Secure storage using encryption.
- Configure monitoring and alerting.

# **MONTH 3 – Databases, Serverless, DevOps & Infrastructure Automation**

## **Week 9 – Databases & DNS Services**

### **Module 9: AWS Database Administration**

## **What You'll Learn**

Deploy highly available relational databases and manage DNS routing using Amazon Route 53 for enterprise applications.

## **Topics Covered**

- Amazon RDS
- SQL Fundamentals
- Multi-AZ Deployment
- Failover Testing
- Read Replica
- Replication
- Route 53
- Hosted Zones
- A Records
- CNAME Records
- Alias Records
- Routing Policies
- Weighted Routing
- Latency-Based Routing
- Multi-Value Routing
- Geolocation Routing

## **Practical Labs**

- Deploy MySQL RDS
- Configure Multi-AZ
- Create Read Replica
- Configure Route 53
- Test DNS Routing Policies

# **Week 10 – Serverless Computing & AWS Automation**

## **Module 10: AWS Serverless Services**

## **What You'll Learn**

Build event-driven serverless applications using AWS Lambda, DynamoDB, CloudWatch, SNS, and CloudTrail while leveraging GenAI for automation.

## Topics Covered

- AWS Lambda
- Lambda Functions
- Lambda using GenAI
- Amazon DynamoDB
- NoSQL Database Concepts
- Primary & Sort Keys
- CloudWatch Integration
- SNS Integration
- CloudTrail
- Event-Driven Architecture

## Practical Labs

- Create Lambda Functions
- Create DynamoDB Tables
- Integrate Lambda with DynamoDB
- Configure CloudWatch Triggers
- Monitor CloudTrail Logs

# Week 11 – DevOps & Continuous Deployment

## Module 11: AWS DevOps Essentials

### What You'll Learn

Understand DevOps practices by implementing CI/CD pipelines using GitHub, AWS CodePipeline, and GenAI-assisted deployment automation.

## Topics Covered

- Introduction to DevOps
- CI/CD Concepts
- GitHub Fundamentals
- GitHub Repository Management
- AWS CodePipeline
- Pipeline Automation
- Automated Deployment
- GenAI for CI/CD

## **Practical Labs**

- Create GitHub Repository
- Configure AWS CodePipeline
- Deploy Sample Application
- Automate Build & Deployment

# **Week 12 – Infrastructure as Code & Capstone Project**

## **Module 12: Cloud Automation & Infrastructure Deployment**

### **What You'll Learn**

Automate AWS infrastructure provisioning using CloudFormation and Terraform while applying Infrastructure as Code (IaC) best practices.

### **Topics Covered**

- Infrastructure as Code (IaC)
- AWS CloudFormation
- CloudFormation Templates
- CloudFormation using GenAI
- Terraform Installation
- AWS CLI Configuration
- Terraform Providers
- Terraform Init
- Terraform Plan
- Terraform Apply
- Terraform Destroy
- Infrastructure Automation Best Practices

## **Practical Labs**

- Deploy Infrastructure using CloudFormation
- Deploy Infrastructure using Terraform
- Automate AWS Resource Provisioning
- Generate Infrastructure Templates using GenAI

# Capstone Project

Students will design, deploy, and manage a complete production-ready AWS cloud infrastructure, including:

- AWS Account Security (IAM & MFA)
- Virtual Private Cloud (VPC)
- Public & Private Subnets
- EC2 Windows & Linux Instances
- Active Directory Integration
- NAT Gateway
- Bastion Host
- VPC Peering
- Security Groups & NACLs
- Load Balancer
- Auto Scaling Group
- Amazon S3 Static Website
- CloudFront Distribution
- Amazon RDS with Multi-AZ
- Route 53 DNS Configuration
- Lambda & DynamoDB Integration
- CloudWatch Monitoring & SNS Alerts
- AWS CodePipeline CI/CD
- Infrastructure as Code using CloudFormation
- Infrastructure Provisioning using Terraform
- Cost Optimization & Billing Analysis
- Infrastructure Automation using AWS CLI & GenAI

## Course Outcomes

Upon successful completion of this course, learners will be able to:

- Design and deploy secure AWS cloud infrastructure.
- Configure VPCs, subnets, routing, VPNs, and hybrid cloud networking.
- Deploy and manage Windows and Linux EC2 instances.
- Implement storage, backup, encryption, and disaster recovery solutions.
- Build scalable applications using Load Balancers and Auto Scaling.
- Configure Amazon RDS, Route 53, Lambda, and DynamoDB.
- Monitor cloud environments using CloudWatch, SNS, and CloudTrail.
- Implement CI/CD pipelines with GitHub and AWS CodePipeline.
- Provision infrastructure using CloudFormation and Terraform.
- Use AWS CLI and Generative AI tools to automate cloud administration.

- Apply AWS security, cost optimization, and operational best practices in production environments.