

AWS Solutions Architect Associate Course Curriculum

Course Introduction

- Overview of AWS, its global infrastructure, and key services.
- Understanding the AWS Shared Responsibility Model.
- Cloud adoption benefits: scalability, cost savings, and flexibility.
- Overview of the AWS Well-Architected Framework.
- Introduction to hands-on learning and labs.
- **LAB:** Instructor will guide students on setting up an AWS account and exploring the AWS Management Console.

Module 1: Architecting Fundamentals

- Understanding the AWS Well-Architected Framework.
- Principles of designing highly available, fault-tolerant architectures.
- Multi-tier architecture design patterns.
- Cost-optimization strategies for AWS workloads.
- AWS global infrastructure: Regions, Availability Zones, and Edge Locations.
- **LAB:** Instructor will guide students in designing and deploying a basic multi-tier architecture on AWS.

Module 2: Account Security

- Identity and Access Management (IAM) fundamentals.
- IAM policies, roles, and best practices for securing AWS accounts.
- Multi-Factor Authentication (MFA) and IAM permissions.
- AWS Organizations and Service Control Policies (SCP).
- Logging and monitoring with AWS CloudTrail and AWS Config.
- **LAB:** Instructor will guide students in setting up IAM users, roles, and policies with least privilege access.

Module 3: Networking 1

- Introduction to AWS Virtual Private Cloud (VPC).
- Subnets, route tables, and Internet Gateway (IGW) configuration.
- Network security: Security Groups (SG) and Network ACLs.
- Connecting on-premises networks using VPN and Direct Connect.
- Overview of AWS Elastic Load Balancer (ELB) and Route 53.

- **LAB:** Instructor will guide students in creating a VPC, setting up subnets, and configuring Security Groups.

Module 4: Compute

- Introduction to AWS EC2 and different instance types.
- Auto Scaling and Elastic Load Balancing for high availability.
- AWS Compute pricing models (On-Demand, Reserved, Spot).
- Amazon EC2 key pairs, AMIs, and security best practices.
- Introduction to AWS Lambda and serverless computing.
- **LAB:** Instructor will guide students in launching EC2 instances and setting up Auto Scaling.

Module 5: Storage

- AWS Storage services: S3, EBS, and EFS.
- Amazon S3 bucket security and lifecycle policies.
- Object storage vs. block storage use cases.
- Data encryption and access control in AWS storage.
- AWS Snowball for offline data migration.
- **LAB:** Instructor will guide students in creating S3 buckets, configuring policies, and exploring EBS volumes.

Module 6: Database Services

- Overview of AWS-managed databases: RDS, DynamoDB, and Aurora.
- RDS multi-AZ deployment and Read Replicas.
- NoSQL databases and DynamoDB architecture.
- AWS Database Migration Service (DMS) for cloud migration.
- Backup and restore strategies for databases.
- **LAB:** Instructor will guide students in deploying an RDS instance and exploring DynamoDB (restricted)

Module 7: Monitoring and Scaling

- AWS CloudWatch for monitoring logs and metrics.
- CloudTrail for auditing AWS API activity.
- Auto Scaling Groups and scaling policies.
- AWS Trusted Advisor for best practices and cost optimization.
- AWS Systems Manager for automation and operational insights.
- **LAB:** Instructor will guide students in setting up CloudWatch alarms and Auto Scaling

Groups.

Module 8: Automation

- Introduction to Infrastructure as Code (IaC) with AWS CloudFormation.
- Automating deployments with AWS Elastic Beanstalk.
- AWS Lambda for event-driven automation.
- AWS CLI and SDK for managing resources programmatically.
- Event-driven architecture with Amazon EventBridge.
- **LAB:** Instructor will guide students in deploying AWS CloudFormation templates and automating resource provisioning.

Module 9: Containers

- Introduction to Docker and containerization.
- Amazon ECS vs. Amazon EKS vs. AWS Fargate.
- Running microservices-based applications on AWS.
- Service discovery and container networking.
- CI/CD pipeline for containerized applications.
- **LAB:** Instructor will guide students in deploying containers using Amazon ECS and AWS Fargate.

Module 10: Networking 2

- VPC peering and Transit Gateway for advanced networking.
- Direct Connect and VPNs for hybrid cloud connectivity.
- AWS Global Accelerator for performance optimization.
- PrivateLink for secure communication between AWS services.
- Web Application Firewall (WAF) and Shield for DDoS protection.
- **LAB:** Instructor will guide students in configuring VPC peering and deploying a Load Balancer.

Module 11: Serverless

- Introduction to serverless computing and AWS Lambda.
- API Gateway for building RESTful services.
- AWS Step Functions for workflow automation.
- Event-driven architecture using SNS and SQS.
- Monitoring and debugging serverless applications.
- **LAB:** Instructor will guide students in deploying serverless applications using AWS

Lambda

Module 12: Edge Services

- Introduction to AWS CloudFront and CDN optimization.
- AWS WAF for web security and DDoS mitigation.
- AWS Global Accelerator for low-latency applications.
- Route 53 for DNS management and domain routing.
- AWS IoT Core for edge computing and real-time processing.

Module 13: Backup and Recovery

- Backup and disaster recovery strategies in AWS.
- AWS Backup service for centralized backup management.
- Snapshots, replication, and retention policies.
- Restoring workloads using AWS Backup and AWS Elastic Disaster Recovery (DRS).
- Compliance and security considerations for backups.