

Course Code: CIS309**Course Name: Amazon Web Services Solution Architect - Associate****Certification: Amazon Web Services Solution Architect – Associate – SAA-C01****Duration: 3 months****Tuition: \$1895****Course Overview**

In this course, you will review how standard IT technologies can be mapped to cloud equivalents in the AWS environment. Explore cloud computing models, global infrastructure, hypervisors, virtual machines, container services and more. The course discusses the various reliable storage options such as S3 storage, Amazon Glacier, EC2 Instance Storage, and AWS Snowball that are available in AWS. These options can be used for backup, archiving, and disaster recovery. You will review best practices and techniques used to design decoupling mechanisms using AWS services. Explore Synchronous and Asynchronous Decoupling, Simple Queue Service (SQS), Amazon Simple Workflow Service (SWF), and Amazon Simple Notification Service (SNS). The course explores AWS architectures and the multi-tiered architectural patterns available for microservices, mobile back ends, and public websites. You will explore the various AWS features available for designing highly available and fault tolerant systems in the cloud. AWS offers a range of purpose-built databases to use with well-architected applications. The course reviews relational, non-relational, data warehousing, in-memory data store, and graph databases. Caching stores previously retrieved or computed data, allowing it to be quickly accessed during future requests. You will explore the various caching options available in AWS, as well as the various high availability solutions that can be used to design a well-architected AWS framework. You will examine scaling, elasticity, and load balancing. Discover architectural best practices for securing AWS data and applications, including data classification, encryption, and tokenization. Amazon Virtual Private Cloud enables AWS resources to be launched in their own isolated virtual network. The course examines the benefits of implementing an Amazon VPC. You will explore the AWS cost optimization techniques and tools used to obtain a balance between availability, durability, and performance. You will also explore best practices and techniques used to design a cost-optimized compute architecture. The course discusses the various management tools available that can be used to provision, monitor, and automate a cloud environment using AWS. Amazon Machine Images (AMI) are used to create virtual machines in AWS. You will explore the various best practices and techniques to follow when implementing AMI's. EC2 auto scaling is a feature that monitors EC2 instances and adjusts capacity to ensure consistent and predictable performance. The course covers the basics of auto scaling and auto scaling groups. Amazon CloudFront is a content delivery network (CDN) service used to delivery content to end users. You will discover how to configure, distribute, and secure content using CloudFront. You will also explore the design principles for a well architected framework in AWS, with focus on serverless workloads.

Course Content**• Lesson 1 – AWS Associate Solution Architect: AWS Primer**

This lesson covers the following topics:

- describe the basics of cloud computing
- list different cloud computing models
- provide an overview of the AWS global infrastructure
- describe common network functionality also available in the cloud
- describe the role of a hypervisor through demonstration
- compare and contrast on-premises and cloud virtual machines
- define what a container service does
- list standard development practices and protocols also available in the cloud
- recognize managed services in the cloud
- specify when HPC should be used
- provide an overview of compliance options available in AWS
- describe cloud components

• Lesson 2 – AWS Associate Solution Architect: AWS Storage Solutions

This lesson covers the following topics:

- describe when to use AWS S3 storage
- use the AWS management console to create an S3 bucket
- describe the benefits of long-term storage using Glacier
- determine which Glacier settings ensure regulatory compliance
- configure Glacier settings in accordance with regulations
- configure an EFS shared folder in AWS
- create an EBS volume
- describe when to use EC2 instance storage
- describe when to use storage gateway
- list the benefits of AWS snowball
- describe when to use CloudFront
- configure S3 and Glacier

• Lesson 3 – AWS Associate Solution Architect: Loose Coupling

This lesson covers the following topics:

- provide an overview of decoupling mechanisms
- describe synchronous decoupling
- describe asynchronous decoupling
- describe how to decouple application components using SQS
- describe how to decouple using SWF
- describe how to use SNS to decouple applications
- implement decoupling mechanism in AWS

- **Lesson 4 – AWS Associate Solution Architect: Architecting for the Cloud**

This lesson covers the following topics:

- discuss the various architectural trade-offs, such as high availability vs. cost, and Amazon Relational Database Service (RDS) vs. installing your own database on Amazon Elastic Compute Cloud (EC2)
- discuss the importance of removing single points of failure
- list the five pillars of a well architected framework in AWS
- provide an overview of a multi-tier architecture
- describe the features of the serverless logic tier, as well as API Gateway and Lambda
- describe the role of the data tier in a multi-tier architecture
- describe the role of the presentation tier in a multi-tier architecture
- list the benefits of the mobile back-end architecture pattern
- configure an Amazon S3 hosted website architecture
- list the benefits of the microservices environment architectural pattern
- design a multi-tiered architecture in AWS

- **Lesson 5 – AWS Associate Solution Architect: High Availability** This lesson covers the following topics:

- list AWS design principles relating to testing, automatic recovery, scaling, capacity, and automation
- list considerations for designing high availability for AWS applications
- describe limit management and networking in AWS
- describe regions in AWS
- describe how to use Availability Zones in AWS
- describe endpoints in AWS
- specify a region for a resource in AWS
- launch an instance in an Availability Zone in AWS
- migrate an instance to another Availability Zone in AWS
- list the benefits of a multi-AZ deployment in AWS
- describe how read replicas can compliment multi-AZ deployments in AWS
- design a highly available deployment in AWS

- **Lesson 6 – AWS Associate Solution Architect: Database Managed Services**

This lesson covers the following topics:

- describe when to use relational databases
- provide an overview of non-relational databases
- describe data warehousing
- describe in-memory data store
- list the benefits of graph databases
- deploy Amazon Aurora

- deploy Amazon RDS MySQL
- deploy DynamoDB
- describe the benefits of Redshift
- list the benefits of ElastiCache
- describe when to use Neptune
- implement an AWS database

- **Lesson 7 – AWS Associate Solution Architect: Caching**

This lesson covers the following topics:

- provide an overview of caching
- describe local and remote database caching options
- plan web application caching
- list the benefits of using ElastiCache with Redis
- describe when to use ElastiCache with Memcached
- use the console to create a Redis cluster
- list the benefits of using a centralized session management data store
- describe when to use CDN caching
- use the console to create a CloudFront configuration
- list considerations when using caching in a hybrid environment
- implement caching in AWS

- **Lesson 8– AWS Associate Solution Architect: Scalability and Elasticity**

This lesson covers the following topics:

- describe how scalability can increase performance and high availability
- describe the concept of scaling horizontally and what can benefit from it
- describe the concept of scaling vertically and what can benefit from it
- describe the benefits of load balancing
- describe the difference between elasticity and scalability
- identify opportunities to use elasticity
- use the AWS console to tag resources
- describe considerations when automating time-based elasticity
- describe considerations when automating volume based elasticity
- configure load balancing
- implement auto-scaling in AWS

- **Lesson 9 – AWS Associate Solution Architect: Architecture Security**

This lesson covers the following topics:

- list the various design principles to strengthen system security
- provide an overview of identity and access management
- list tools used to identify potential security threats or incidents
- describe approaches used to protect infrastructure

- describe how to use data classification to categorize organizational data
- list the benefits of encryption and tokenization
- describe how to protect data at rest
- describe Amazon Certificate Manager capabilities
- describe how to enable automated archiving
- describe how a WAF can help secure applications
- provide an overview of the Amazon Inspector service
- implement data security in AWS

- **Lesson 10 – AWS Associate Solution Architect: Virtual Private Cloud**

This lesson covers the following topics:

- provide an overview of the VPC
- describe the different levels of network isolation
- list VPC networking components such as network interfaces, NAT, and IP address
- provide an overview of IP addressing in VPC
- use the management console to deploy a VPC
- describe how to automate the deployment of infrastructure
- describe how to use security groups and network ACLs
- use the management console to configure a security group
- allow Internet access for a VPC subnet
- use the management console to configure a network ACL
- provide an overview of the available VPC connectivity options
- configure VPC network infrastructure

- **Lesson 11 – AWS Associate Solution Architect: Optimizing Storage**

This lesson covers the following topics:

- list design principles related to cost optimization
- use the appropriate services and resources for key cost savings
- identify data storage requirements
- use the GUI to set the storage class during file upload
- use the GUI to change the storage class for existing objects
- set the storage class when using the CLI to upload S3 content
- change EBS volume settings to reduce costs
- demonstrate how to navigate the AWS Billing and Cost Management console
- demonstrate how to use S3 analytics
- track AWS usage and provide estimated charges
- set custom cost and usage budgets using the dashboard
- implement cost-optimized storage

- **Lesson 12 – AWS Associate Solution Architect: Optimizing Compute Resources**

This lesson covers the following topics:

- describe how to optimize compute costs using EC2
- list the compute benefits of lightsail
- describe how to optimize compute costs using the elastic container service
- use the console to deploy a Lightsail configuration
- use the console to deploy an ECS container
- use the management console to manage a lightsail configuration
- deploy a reserved instance using the management console
- deploy a spot instance using the management console
- demonstrate how to use the cost explorer utility
- demonstrate how to filter data in cost explorer
- run an EC2 instance usage report
- implement cost optimization in AWS

- **Lesson 13 – AWS Associate Solution Architect: Managing AWS**

This lesson covers the following topics:

- provide an overview of CloudTrail
- view events and create a trail in CloudTrail
- work with CloudTrail log files
- list the benefits of using CloudFormation
- deploy AWS resources using a CloudFormation template
- create and manage catalogs of services
- manage and monitor AWS resources using CloudWatch
- prepare an IAM role that will be attached to an EC2 instance
- use Systems Manager to execute a PowerShell command on a Windows EC2 instance
- assess, audit, and evaluate AWS configurations
- describe how to use the OpsWorks configuration management service
- optimize infrastructure using the trusted advisor
- manage a cloud environment in AWS

- **Lesson 14 – AWS Associate Solution Architect: Amazon Machine Images**

This lesson covers the following topics:

- describe the purpose of AMIs
- describe AMI types
- describe when to use shared AMIs
- describe when to use paid AMIs
- use the console and CLI tools to view AMIs
- create and use a custom Linux AMI through the console
- use the CLI to create a new AMI

- use PowerShell to create a new AMI
- modify AMI settings
- demonstrate how to copy an AMI to a different AWS region using the console
- demonstrate how to copy an AMI to a different AWS region using the CLI
- demonstrate how to copy an AMI to a different AWS region using PowerShell
- implement an AMI

- **Lesson 15 – AWS Associate Solution Architect: Auto Scaling**

This lesson covers the following topics:

- list the benefits of auto scaling
- describe the auto scaling lifecycle
- create a launch configuration through the AWS Management Console
- create an auto scaling group
- demonstrate manual scaling
- configure scheduled actions
- discuss auto scaling cooldown options
- monitor auto scaling instances and groups
- use the CLI to create a launch configuration
- use the CLI to create an auto scaling group
- use PowerShell to create a launch configuration
- use PowerShell to create an auto scaling group
- implement auto scaling

- **Lesson 16 – AWS Associate Solution Architect: Amazon CloudFront and Route 53**

This lesson covers the following topics:

- list CloudFront use cases
- provide an overview of distributions
- create a CloudFront distribution
- describe how HTTPS and field-level encryption work with CloudFront
- view CloudFront billing and usage reports
- use monitoring and reporting features for CloudFront
- describe how Route 53 provides DNS services
- use the management console to create a hosted DNS zone
- use the AWS CLI to create a hosted DNS zone
- use PowerShell to create a hosted DNS zone
- describe how Route 53 can route DNS-related traffic efficiently
- use the console to create a DNS weighted rule
- describe DNS resource record types
- use the management console to create a resource record set
- implement CloudFront features

- **Lesson 17 – AWS Associate Solution Architect: Building and Managing AWS Solutions**

This lesson covers the following topics:

- map AWS services to business IT system needs
- describe AWS solutions that enhance reliability
- describe AWS solutions that enhance security
- create access and secret keys using the console
- create a SNS topic for email notification using the console
- use the console to create a SQS queue
- enable CLI management of AWS
- enable PowerShell management of AWS
- create a CloudWatch alarm to recover a failed EC2 instance
- use the console to enable S3 bucket cross region replication
- attach a second network interface to an EC2 instance
- execute common AWS management tasks