

AWS Certified Solutions Architect – Associate + Terraform + CI/CD (60-Hour Course)

Course Overview

A comprehensive 60-hour hands-on course covering AWS Certified Solutions Architect – Associate (SAA-C03) exam concepts, Terraform infrastructure as code, and AWS native CI/CD tools for real-world DevOps automation.

AWS Certified Solutions Architect – Associate (40 Hours)

1. Getting Started (2 hours)

- AWS Certification overview – SAA-C03 exam objectives
 - Understanding AWS global infrastructure: Regions, AZs, Edge Locations
 - Creating a free-tier account and navigating the AWS Management Console
 - AWS CLI & SDK introduction
 - Setting up IAM users for lab use
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2. Fundamentals of Cloud Computing Platform (2 hours)

- What is Cloud Computing: IaaS, PaaS, SaaS
 - Benefits of AWS: scalability, elasticity, pay-as-you-go
 - Shared Responsibility Model
 - AWS Well-Architected Framework overview
 - Pricing models and AWS Pricing Calculator
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3. Infrastructure and Networking (4 hours)

- Amazon EC2 overview
- Instance types, AMIs, EBS volumes, snapshots
- EC2 purchasing options: On-Demand, Reserved, Spot, Savings Plans
- Elastic IPs and placement groups
- Security Groups and NACLs
- VPC basics: subnets, route tables, Internet gateway, NAT gateway

4. Storage (3 hours)

- S3 overview and storage classes (Standard, IA, Glacier, Intelligent-Tiering)
 - Versioning, lifecycle policies, replication
 - Bucket policies and access control
 - EBS and EFS overview
 - Storage Gateway overview
 - **Hands-on:** Host a static website in S3 with lifecycle configuration
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5. Load Balancing Solutions (2 hours)

- Elastic Load Balancing (ELB) types: ALB, NLB, GLB
 - Target groups, health checks, listener rules
 - High availability design across multiple AZs
 - **Hands-on:** Deploy an ALB in front of EC2 instances
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6. Auto Scaling and Deployments (3 hours)

- Auto Scaling Groups (ASG) concepts
 - Launch templates and scaling policies
 - Integration with ELB
 - Blue-Green and Rolling deployments
 - Elastic Beanstalk overview
 - **Hands-on:** Configure ASG with EC2 and ALB
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7. Networking (4 hours)

- Deep dive into VPC design
 - CIDR blocks, subnets, route tables
 - NAT, Internet Gateway, Transit Gateway, VPC peering
 - PrivateLink and VPC Endpoints
 - Hybrid connectivity: VPN, Direct Connect
 - **Hands-on:** Build a 3-tier VPC (public + private + DB subnets)
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8. Identity and Access Management (IAM) (2 hours)

- IAM users, groups, roles, and policies

- AWS managed vs custom policies
 - Cross-account access
 - IAM best practices
 - **Hands-on:** Create IAM roles for EC2 and Lambda
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9. Cryptography (1 hour)

- AWS KMS overview
 - Customer managed vs AWS managed keys
 - Encryption at rest and in transit
 - Secrets Manager and Parameter Store
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10. Serverless Architecture (3 hours)

- AWS Lambda fundamentals
 - Event-driven architecture concepts
 - API Gateway + Lambda integration
 - Step Functions overview
 - SNS and SQS integration
 - **Hands-on:** Build a serverless web app
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11. Database (3 hours)

- RDS overview: MySQL, PostgreSQL, Aurora
 - Multi-AZ vs Read replicas
 - DynamoDB fundamentals
 - Caching with ElastiCache (Redis, Memcached)
 - Backup and restore
 - **Hands-on:** Deploy RDS instance with read replica
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12. Scalable Applications (2 hours)

- Designing for fault tolerance and high availability
 - Multi-region deployment design
 - Decoupled architecture using SQS, SNS, EventBridge
 - Microservices design patterns
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13. Domain Name System (DNS)(1 hour)

- Route 53 overview
 - Hosted zones, record types (A, CNAME, Alias)
 - Routing policies (simple, weighted, latency-based, failover)
 - **Hands-on:** Integrate Route 53 with an ALB
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14. Analytics (1 hour)

- CloudWatch Logs Insights
 - AWS Athena overview
 - S3 data analysis pipeline
 - QuickSight overview
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15. Content Delivery Network (CDN)(1 hour)

- CloudFront overview and edge locations
 - Origin configuration (S3, ALB, API Gateway)
 - Caching, invalidation, signed URLs
 - **Hands-on:** Integrate CloudFront with S3 website
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16. Monitoring (2 hours)

- CloudWatch metrics, alarms, dashboards
 - CloudTrail for API logging
 - AWS Config for compliance
 - Trusted Advisor overview
 - **Hands-on:** Create custom CloudWatch dashboard and alerts
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17. Container Services (3 hours)

- ECS vs EKS overview
 - Fargate mode introduction
 - Task definitions, services, and clusters
 - ECR (Elastic Container Registry) overview
 - **Hands-on:** Deploy container app using ECS Fargate
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18. Exam Preparation Guide (2 hours)

- Exam format, scoring, and time management
 - Question-solving strategies
 - AWS whitepapers and FAQs
 - Mock test discussion
 - Common pitfalls and best practices
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Terraform and AWS Infrastructure (10 Hours)

19. Terraform Basics (3 hours)

- Introduction to Infrastructure as Code (IaC)
 - Terraform architecture: Providers, State, Modules
 - Installing and configuring Terraform
 - Basic commands: `init`, `plan`, `apply`, `destroy`
 - Variables, outputs, and tfstate file management
 - **Hands-on:** Create and destroy a simple EC2 instance using Terraform
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20. AWS Infrastructure Provisioning with Terraform (4 hours)

- Creating VPC, subnets, route tables, Internet gateways
 - Launching EC2 instances and attaching security groups
 - Creating S3 buckets and IAM roles
 - Using Terraform modules for reusability
 - Remote backend using S3 and DynamoDB for state locking
 - **Hands-on:** Deploy a 3-tier AWS infrastructure using Terraform
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21. Complete CI/CD Project with AWS DevOps Tools (3 hours)

- Overview of AWS CI/CD tools: CodeCommit, CodeBuild, CodeDeploy, CodePipeline
- Setting up CodeCommit repository
- Building and testing with CodeBuild
- Deploying with CodeDeploy (EC2/AutoScaling integration)
- Orchestrating with CodePipeline
- **Final Project:**
 - Source → Build → Deploy workflow
 - Use Terraform to provision infrastructure

- Automate full CI/CD pipeline deployment
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Time Summary

Section	Duration
AWS Core Modules	40 hrs
Terraform Modules	7 hrs
AWS CI/CD Project	3 hrs
Total Duration	60 Hours

Learning Outcomes

By the end of this 60-hour course, learners will be able to:

- Design secure, scalable, and cost-optimized AWS architectures
 - Deploy and manage cloud applications using best practices
 - Automate AWS infrastructure using Terraform
 - Build a fully automated CI/CD pipeline using AWS DevOps tools
 - Prepare confidently for the AWS Certified Solutions Architect – Associate exam
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