

Developing on AWS

Duration	Delivery Method	Level
3 days	Online / Instructor Led	Intermediate

The Developing on AWS course is designed to help individuals design and build secure, reliable and scalable AWS-based applications. In this course, we cover fundamental concepts and baseline programming for developing applications on AWS. We also show you how to work with AWS code libraries, SDKs, and IDE toolkits so that you can effectively develop and deploy code on the AWS platform.

Audience Profile

- Developers

Prerequisite

- Working knowledge of software development
- Familiarity with cloud computing concepts
- Basic familiarity with .NET (C#) or Java
- Prior experience with AWS is not required.

Course Objectives

After completing this course, students will be able to:

- Install and configure SDKs and IDE toolkits
- Automate basic service operations using C# or Java
- Use security models to manage access to AWS
- Understand deployment models and usage with AWS
- Build AWS Lambda functions with other service integrations for your web applications.
- Understand the benefits of microservices architectures and serverless applications to design.
- Develop API Gateway components and integrate with other AWS services.
- Explain how Amazon Cognito controls user access to AWS resources.
- Build a web application using Cognito to provide and control user access.
- Use DevOps methodology to reduce the risks associated with traditional application releases and identify AWS services that help in implementing DevOps practices.
- Use AWS Serverless Application Model (AWS SAM) to deploy an application.
- Observe your application build using Amazon X-Ray

Course Content

Module 1: Building a Web Applications

- Discuss the architecture of the application you are going to build during this course
- Explore the AWS services needed to build your web application
- Discover how to store, manage, and host your web application

Module 2: Getting started with development on AWS

- Describe how to access AWS services programmatically
- List some programmatic patterns and how they provide efficiencies within AWS SDKs and AWS CLI
- Explain the value of AWS Cloud9

Module 3: Getting started with Permissions

- Review AWS Identity and Access Management (IAM) features and components permissions to support a development environment
- Demonstrate how to test AWS IAM permissions
- Configure your IDEs and SDKs to support a development environment
- Demonstrate accessing AWS services using SDKs and AWS Cloud9
- Lab 1: Configure the Developer Environment
- Connect to a developer environment
- Verify that the IDE and the AWS CLI are installed and configured to use the application profile
- Verify that the necessary permissions have been granted to run AWS CLI commands
- Assign an AWS IAM policy to a role to delete an Amazon S3 bucket

Module 4: Getting started with Storage

- Describe the basic concepts of Amazon S3
- List the options for securing data using Amazon S3
- Define SDK dependencies for your code
- Explain how to connect to the Amazon S3 service
- Describe request and response objects

Module 5: Processing your storage operations

- Perform key bucket and object operations
- Explain how to handle multiple and large objects
- Create and configure an Amazon S3 bucket to host a static website
- Grant temporary access to your objects
- Demonstrate performing Amazon S3 operations using SDKs
- Lab 2: Develop Solutions Using Amazon S3
- Interact with Amazon S3 programmatically using AWS SDKs and the AWS CLI
- Create a bucket using waiters and verify service exceptions codes
- Build the needed requests to upload an Amazon S3 object with metadata attached
- Build requests to download an object from the bucket, process data, and upload the object back to the bucket
- Configure a bucket to host the website and sync the source files using the AWS CLI
- Add IAM bucket policies to access the S3 website.

Module 6: Getting started with Databases

- Describe the key components of DynamoDB
- Explain how to connect to DynamoDB
- Describe how to build a request object
- Explain how to read a response object
- List the most common troubleshooting exceptions

Module 7: Processing your Database operations

- Develop programs to interact with DynamoDB using AWS SDKs
- Perform CRUD operations to access tables, indexes, and data
- Describe developer best practices when accessing DynamoDB
- Review caching options for DynamoDB to improve performance
- Perform DynamoDB operations using SDK
- Lab 3: Develop Solutions Using Amazon DynamoDB
- Interact with Amazon DynamoDB programmatically using low-level, document, and high level APIs in your programs
- Retrieve items from a table using key attributes, filters, expressions, and paginations
- Load a table by reading JSON objects from a file
- Search items from a table based on key attributes, filters, expressions, and paginations
- Update items by adding new attributes and changing data conditionally
- Access DynamoDB data using PartiQL and object-persistence models where applicable

Module 8: Processing Your Application Logic

- Develop a Lambda function using SDKs
- Configure triggers and permissions for Lambda functions
- Test, deploy, and monitor Lambda functions
- Lab 4: Develop Solutions Using AWS Lambda Functions
- Create AWS Lambda functions and interact programmatically using AWS SDKs and AWS CLI
- Configure AWS Lambda functions to use the environment variables and to integrate with other services
- Generate Amazon S3 pre-signed URLs using AWS SDKs and verify the access to bucket objects
- Deploy the AWS Lambda functions with .zip file archives through your IDE and test as needed
- Invoke AWS Lambda functions using the AWS Console and AWS CL

Module 9 : Managing the APIs

- Describe the key components of API Gateway
 - Develop API Gateway resources to integrate with AWS services
 - Configure API request and response calls for your application endpoints
- Test API resources and deploy your application API endpoint
- Demonstrate creating API Gateway resources to interact with your application APIs
 - Lab 5: Develop Solutions Using Amazon API Gateway
 - Create RESTful API Gateway resources and configure CORS for your application
 - Integrate API methods with AWS Lambda functions to process application data
 - Configure mapping templates to transform the pass-through data during method integration
 - Create a request model for API methods to ensure that the pass-through data format complies with application rules
 - Deploy the API Gateway to a stage and validate the results using the API endpoint

Module 10 : Building a Modern Application

- Describe the challenges with traditional architectures
- Describe the microservice architecture and benefits
- Explain various approaches for designing microservice applications
- Explain steps involved in decoupling monolithic applications
- Demonstrate the orchestration of Lambda Functions using AWS Step Functions

Module 11: Granting Access to your application

- Analyse the evolution of security protocols
- Explore the authentication process using Amazon Cognito
- Manage user access and authorise serverless APIs
- Observe best practices for implementing Amazon Cognito
- Demonstrate the integration of Amazon Cognito and review JWT tokens
- Lab 6: Capstone – Complete the Application Build
- Create a Userpool and an Application Client for your web application using
- Add new users and confirm their ability to sign-in using the Amazon Cognito CLI
- Configure API Gateway methods to use Amazon Cognito as an authoriser
- Verify JWT authentication tokens are generated during API Gateway calls
- Develop API Gateway resources rapidly using a Swagger importing strategy
- Set up your web application frontend to use Amazon Cognito and API Gateway configurations and verify the entire application functionality