

Course Outline

AWS Academy Cloud Foundations (ACF)

Course Version

This course outline applies to version 2.0 of *AWS Academy Cloud Formations* in English. Details of changes from version 1.0 are available in the Instructor Guide.

Description

AWS Academy Cloud Foundations is intended for students who seek an overall understanding of cloud computing concepts, independent of specific technical roles. It provides a detailed overview of cloud concepts, AWS core services, security, architecture, pricing, and support.

Course Objectives

Upon completion of this course, students will be able to:

- Define the AWS Cloud
- Explain the AWS pricing philosophy
- Identify the global infrastructure components of AWS
- Describe the security and compliance measures of the AWS Cloud, including AWS Identity and Access Management (IAM)
- Create a virtual private cloud (VPC) by using Amazon Virtual Private Cloud (Amazon VPC)
- Demonstrate when to use Amazon Elastic Compute Cloud (Amazon EC2), AWS Lambda, and AWS Elastic Beanstalk
- Differentiate between Amazon Simple Storage Service (Amazon S3), Amazon Elastic Block Store (Amazon EBS), Amazon Elastic File System (Amazon EFS), and Amazon Simple Storage Service Glacier (Amazon S3 Glacier)
- Demonstrate when to use AWS database services, including Amazon Relational Database Service (Amazon RDS), Amazon DynamoDB, Amazon Redshift, and Amazon Aurora
- Explain the architectural principles of the AWS Cloud
- Explore key concepts related to Elastic Load Balancing, Amazon CloudWatch, and Amazon EC2 Auto Scaling

Duration

Approximately 20 hours, when delivered synchronously by an educator. Detailed timings are provided below. Actual delivery times will vary from class to class and depending on the delivery format. AWS Academy Cloud Foundations must be delivered over a period of at least two weeks.

Intended Audience

This introductory (level 100) course is intended for AWS Academy member institutions.

Student Prerequisites

This is an entry-level course, but students should possess:

- General IT technical knowledge
- General IT business knowledge

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Delivery Methods

This course can be delivered in person with synchronous lectures or with digital training models that students can complete independently.

Educator Prerequisites

There are no prerequisites to facilitate this course. However, prior to facilitating this course, educators are recommended to complete the AWS Academy Cloud Foundations course, pass the AWS Certified Cloud Practitioner exam, and participate in an AWS “Ready-to-Teach” Webinar Series.

Learning Resources

- Lecture materials
- Online multiple-choice knowledge checks
- Lab exercises
- Digital training (optional)
- Video introductions
- Video demos
- Example solutions

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Course Contents

Digital training materials cover the same content as the lectures. It is not necessary to use both.

		Lecture	Activity	Total
Course Introduction		35 min.		35 min.
Lecture or Video	Introduction			
Module 1: Cloud Concepts Overview		45 mins	15 mins	60 min.
Lecture or Video	Introduction to Cloud Computing			
Lecture or Video	Advantages of the Cloud			
Lecture or Video	Introduction to AWS			
Lecture or Video	Moving to the AWS Cloud			
Lecture or Video	Wrap Up			
Activity	Sample Exam Question		5 mins	
Knowledge Check	Cloud Concepts		10 mins	
Module 2: Cloud Economics and Billing		45 min.	55 min.	100 min.
Lecture or Video	Introduction			
Lecture or Video	Fundamentals of Pricing			
Lecture or Video	Total Cost of Ownership			
Activity	Simple Monthly Calculator		20 min.	
Lecture or Video	Delaware North Case Study			
Lecture or Video	AWS Organizations			
Lecture or Video	AWS Billing and Cost Management			
Educator Demo	Billing Dashboard		10 min.	
Lecture or Video	Technical Support Models			
Activity	Support Plan Scavenger Hunt		10 min.	
Lecture or Video	Wrap-Up			
Activity	Sample Exam Question		5 min.	
Knowledge Check	Cloud Billing Economics		10 min.	
Module 3: AWS Global Infrastructure Overview		25 min.	45 min.	70 min.
Lecture or Video	Introduction			
Lecture or Video	AWS Global Infrastructure			
Educator Demo	AWS Global Infrastructure		10 min.	
Lecture or Video	AWS Services and Service Categories			
Activity	AWS Management Console Clickthrough		20 min.	
Lecture or Video	Wrap Up			
Activity	Sample Exam Question		5 min.	
Knowledge Check	AWS Infrastructure		10 min.	
Module 4: Cloud Security		45 min.	70 min.	115 min.
Lecture or Video	Introduction			
Lecture or Video	AWS Shared Responsibility Model			
Activity	AWS Shared Responsibility Model		10 min.	
Lecture or Video	AWS IAM			
Video Demo	AWS IAM Console Demonstration		5 min.	
Lecture or Video	Securing a New AWS Account			
Lab Exercise	Introduction to AWS IAM		40 min.	
Lecture or Video	Securing Accounts			
Lecture or Video	Securing Data			
Lecture or Video	Working to Ensure Compliance			

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Lecture or Video	Wrap Up			
Activity	Sample Exam Question		5 min.	
Knowledge Check	Cloud Security		10 min.	
Module 5: Networking and Content Delivery		60 min.	70 min.	130 min.
Lecture or Video	Introduction			
Lecture or Video	Networking Basics			
Lecture or Video	Amazon VPC			
Lecture or Video	VPC Networking			
Activity	Label This Diagram		5 min.	
Video Demo	Amazon VPC Console Demonstration		5 min.	
Lecture or Video	VPC Security			
Activity	Design a VPC		15 min.	
Lab Exercise	Build a VPC and Launch a Web Server		30 min.	
Lecture or Video	Route 53			
Lecture or Video	CloudFront			
Lecture or Video	Wrap Up			
Activity	Sample Exam Question		5 min.	
Knowledge Check	VPC		10 min.	
Module 6: Compute		80 min.	145 min.	225 min.
Lecture or Video	Introduction			
Lecture or Video	Compute Services Overview			
Lecture or Video	Amazon EC2 Part 1			
Lecture or Video	Amazon EC2 Part 2			
Lecture or Video	Amazon EC2 Part 3			
Video Demo	Amazon EC2		5 min.	
Lab Exercise	Introduction to Amazon EC2		35 min.	
Activity	Amazon EC2 versus Managed Services		30 min.	
Video Demo	Amazon EC2 Part Console Demonstration			
Lecture or Video	Amazon EC2 Cost Optimization			
Lecture or Video	Container Services			
Lecture or Video	Introduction to AWS Lambda			
Activity	AWS Lambda		30 min.	
Lecture or Video	Introduction to AWS Elastic Beanstalk			
Activity	AWS Elastic Beanstalk		30 min.	
Lecture or Video	Wrap Up			
Activity	Sample Exam Question		5 min.	
Knowledge Check	Amazon Virtual Private Cloud		10 min.	
Module 7: Storage		45 min.	85 min.	130 min.
Lecture or Video	Introduction			
Lecture or Video	AWS EBS			
Video Demo	Amazon Elastic Block Store Console Demonstration		5 min.	
Lab Exercise	Working with EBS		30 min.	
Lecture or Video	AWS S3			
Video Demo	AWS S3 Console Demonstration		5 min.	
Lecture or Video	AWS EFS			
Video Demo	AWS EFS Console Demonstration		5 min.	
Lecture or Video	AWS S3 Glacier			
Video Demo	AWS S3 Glacier Console Demonstration		5 min.	
Activity	Storage Technology Selection		20 min.	

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Lecture or Video	Wrap Up			
Activity	Sample Exam Question		5 min.	
Knowledge Check	Storage		10 min.	
Module 8: Databases		60 min.	70 min.	130 min.
Lecture or Video	Introduction			
Lecture or Video	Amazon RDS			
Video Demo	Amazon RDS Console Demonstration		5 min.	
Lab Exercise	Build a Database Server		30 min.	
Lecture or Video	Amazon DynamoDB			
Video Demo	Amazon DynamoDB Demonstration		5 min.	
Lecture or Video	Amazon Redshift			
Lecture or Video	Amazon Aurora			
Activity	Database Case Study		15 min.	
Lecture or Video	Wrap Up			
Activity	Sample Exam Question		5 min.	
Knowledge Check	Databases		10 min.	
Module 9 – Cloud Architecture		40 min.	75 min.	115 min.
Lecture or Video	Introduction			
Lecture or Video	AWS Well-Architected Framework Design Principles			
Activity	AWS Well-Architected Framework Design Principles		50 min.	
Lecture or Video	Operational Excellence			
Lecture or Video	Security			
Lecture or Video	Reliability			
Lecture or Video	Performance Efficiency			
Lecture or Video	Cost Optimization			
Lecture or Video	Reliability & High Availability			
Lecture or Video	AWS Trusted Advisor			
Activity	Interpret AWS Trusted Advisor Recommendations		10 min.	
Lecture or Video	Wrap Up			
Activity	Sample Exam Question		5 min.	
Knowledge Check	Cloud Architecture		10 min.	
Module 10 – Automatic Scaling and Monitoring		35 min.	55 min.	90 min.
Lecture or Video	Introduction			
Lecture or Video	Elastic Load Balancing			
Activity	Elastic Load Balancing		5 min.	
Lecture or Video	Amazon CloudWatch			
Activity	Amazon CloudWatch		5 min.	
Lecture or Video	Amazon EC2 Auto Scaling			
Lab Exercise	Scale & Load Balance your Architecture		30 min.	
Lecture or Video	Wrap Up			
Activity	Sample Exam Question		5 min.	
Knowledge Check	Autoscale		10 min.	
Optional				
Lab	Sandbox			

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Module Objectives

Module 0: Course Introduction

The purpose of this module is to introduce the AWS Academy Cloud Foundations course to students.

At the end of this module, students should be able to:

- Recognize the purpose of Academy Cloud
- FoundationsRecognize the course structure
- Recognize the AWS certification process
- Navigate the AWS Documentation website

Module 1: Cloud Concepts Overview

The purpose of this module is to introduce students to cloud computing, Amazon Web Services (AWS), and what AWS offers.

At the end of this module, students should be able to:

- Define different types of cloud computing models
- Describe six advantages of cloud computing
- Recognize the main AWS service categories and core services
- Review the AWS Cloud Adoption Framework (AWS CAF)

Module 2 - Cloud Economics and Billing

The purpose of this module is to introduce students to the business advantages for moving to the cloud. The module begins by explaining the pricing philosophy of AWS and the overall concept of Total Cost of Ownership. These concepts are important for your students to understand because they might need to rely on them in their careers as cloud practitioners.

After providing this conceptual foundation, the module describes the following tools that are available for understanding and explaining the costs for running AWS services:

- AWS TCO Calculator
- AWS Simple Monthly Calculator
- AWS Organizations
- AWS Billing Dashboard

At the end of this module, students should be able to:

- Explain the AWS pricing philosophy
- Recognize fundamental pricing characteristics
- Indicate the elements of the Total Cost of Ownership
- Discuss the results of the Simple Monthly Calculator
- Identify how to set up an organizational structure that simplifies billing and account visibility
- Identify the functionality in the AWS Billing Dashboard

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- Describe how to use AWS Billing, AWS Cost Explorer, AWS Budgets, and AWS Cost and Usage Reports
- Identify the various AWS technical support plans and their costs

Module 3: AWS Global Infrastructure Overview

The purpose of this module is to introduce the Amazon Web Services (AWS) Global Infrastructure.

At the end of this module, students should be able to:

- Identify the difference between AWS Regions, Availability Zones, and edge locations
- Identify AWS services and service categories

Module 4: AWS Cloud Security

The purpose of this module is to provide an introduction to the AWS approach to security. This module includes the controls in the AWS environment, and some of the AWS products and features that customers can use to meet their security objectives.

At the end of this module, students should be able to:

- Recognize the shared responsibility model
- Identify the responsibility of the customer and AWS
- Recognize IAM users, groups, and roles
- Describe different types of security credentials in IAM
- Identify the steps to securing a new AWS account
- Explore IAM users and groups
- Recognize how to secure AWS data
- Recognize AWS compliance programs

Module 5: Networking and Content Delivery

The purpose of this module is to introduce students to three fundamental AWS networking and content delivery services: Amazon Virtual Private Cloud (Amazon VPC), Amazon Route 53, and Amazon CloudFront. Students will have the opportunity to label a virtual private cloud (VPC) network architecture diagram, design a VPC, watch how a VPC is built, and finally build a VPC themselves.

At the end of this module, students should be able to:

- Recognize the basics of networking
- Describe virtual networking in the cloud with Amazon VPC
- Label a network diagram
- Design a basic VPC architecture
- Indicate the steps to build a VPC
- Identify security groups
- Create their own VPC and add additional components to it to produce a customized network
- Identify the fundamentals of Amazon Route 53
- Recognize the benefits of Amazon CloudFront

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Module 6: Compute

The purpose of this module is to introduce many of the compute services that Amazon Web Services (AWS) offers. These services include Amazon Elastic Compute Cloud (Amazon EC2), AWS Lambda, AWS Elastic Beanstalk, Amazon Elastic Container Service (Amazon ECS), Amazon Elastic Container Registry (ECR), and Amazon Elastic Kubernetes Service (Amazon EKS).

At the end of this module, students should be able to:

- Provide an overview of different AWS compute services in the cloud
- Demonstrate why to use Amazon Elastic Compute Cloud (Amazon EC2)
- Identify the functionality in the Amazon EC2 console
- Perform basic functions in Amazon EC2 to build a virtual computing environment
- Identify Amazon EC2 cost-optimization elements
- Demonstrate when to use AWS Elastic Beanstalk
- Demonstrate when to use AWS Lambda
- Identify how to run containerized applications in a cluster of managed servers

Module 7: Storage

The purpose of this module is to introduce students to the various options for storing data with AWS. The module describes four different storage technologies. The module focuses on the storage services that are described so that students can decide which storage service to use for various use cases. Storage is one of the core AWS service areas, and it is important for your students to understand the advantages and disadvantages of each technology. The module concludes with an activity that gives students an opportunity to apply what they learned to a real-world scenario. After providing this conceptual foundation, the module describes the following storage services:

- Amazon Elastic Block Store (Amazon EBS)
- Amazon Simple Storage Service (Amazon S3)
- Amazon Elastic File System (Amazon EFS)
- Amazon Simple Storage Service Glacier

At the end of this module, students should be able to:

- Identify the different types of storage
- Explain Amazon Simple Storage Service (Amazon S3)
- Identify the functionality in Amazon S3
- Explain Amazon Elastic Block Store (Amazon EBS)
- Identify the functionality in Amazon EBS
- Perform functions in Amazon EBS to build an EC2 storage solution
- Explain Amazon Elastic File System (Amazon EFS)
- Identify the functionality in Amazon EFS
- Explain Amazon Simple Storage Service Glacier
- Identify the functionality in Amazon S3 Glacier
- Differentiate between Amazon EBS, Amazon S3, Amazon EFS, and Amazon S3 Glacier

Module 8: Databases

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The purpose of this module is to introduce students to four of the most commonly used AWS database services. The module describes four different database services. The module focuses on the database services that are described so that students can decide which database service to use for various use cases. Databases are one of the core AWS service areas, and it is important for your students to understand the advantages and disadvantages of each service. The module concludes with an activity that gives students an opportunity to apply what they learned to a real-world scenario. After providing this conceptual foundation, the module describes the following database services:

- Amazon Relational Database Service (Amazon RDS)
- Amazon DynamoDB
- Amazon Redshift
- Amazon Aurora

At the end of this module, students should be able to:

- Explain Amazon Relational Database Service (Amazon RDS)
- Identify the functionality in Amazon RDS
- Explain Amazon DynamoDB
- Identify the functionality in Amazon DynamoDB
- Explain Amazon Redshift
- Explain Amazon Aurora
- Perform tasks in an Amazon RDS database such as launching, configuring, and interacting

Module 9: Cloud Architecture

The purpose of this module is to introduce students to designing and building cloud architectures according to best practices.

- At the end of this module, students should be able to:
- Describe the AWS Well-Architected Framework, including the five pillars
- Identify the design principles of the AWS Well-Architected Framework
- Explain the importance of reliability and high availability
- Identify how AWS Trusted Advisor helps customers
- Interpret AWS Trusted Advisor recommendations

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Module 10: Automatic Scaling and Monitoring

The purpose of this module is to introduce students to three fundamental AWS services –Elastic LoadBalancing, Amazon Elastic Compute Cloud (Amazon EC2) Auto Scaling, and Amazon CloudWatch – which can be used together to build dynamic, scalable architectures.

At the end of this module, students should be able to:

- Indicate how to distribute traffic across Amazon EC2 instances by using Elastic Load Balancing
- Identify how Amazon CloudWatch enables you to monitor AWS resources and applications in real time
- Explain how Amazon EC2 Auto Scaling launches and releases servers in response to workload changes
- Perform scaling and load balancing tasks to improve an architecture