

Course Outline

AWS Academy Cloud Foundations (ACF)

Course Version

This course outline applies to version 1.0 of *AWS Academy Cloud Formations* in English.

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:

- Describe the six advantages of cloud computing
- Describe three cloud deployment models
- Use the AWS Cloud Adoption Framework to help organizations transform the way they work
- Understand the AWS pricing philosophy
- Review fundamental pricing characteristics
- Understand the elements of Total Cost of Ownership
- Understand the difference between AWS Regions, Availability Zones, and Edge Locations
- Understand the different AWS compute services
- Describe Amazon Elastic Compute Cloud
- Explain AWS Lambda, which is serverless computing
- Describe AWS Elastic Beanstalk
- Discuss storage services including Amazon EBS, Amazon S3, Amazon EFS, and Amazon Glacier
- Describe use cases for storage options, along with a demonstration of Amazon Glacier
- Understand storage pricing
- Understand virtual networking in the cloud with Amazon VPC
- Create virtual firewalls with security groups
- Secure delivery of data, videos, applications, and APIs with Amazon CloudFront
- Provide an overview of different database services in the cloud
- Highlight the differences between unmanaged and managed database solutions
- Differentiate between Structured Query Language and NoSQL databases
- Review the availability differences of alternative database solutions
- Learn how to distribute traffic across Amazon EC2 instances using Elastic Load Balancing
- Discover the ability of Auto Scaling to launch servers in response to workload changes
- Use CloudWatch to monitor AWS resources and applications in real time
- Describe the AWS Shared Responsibility Model
- Examine IAM users, groups, and roles
- Describe different types of security credentials
- Review the AWS Trusted Advisor checks
- Discuss security compliance
- Understand best practices on day 1 with a new AWS account
- Explore the well-architected pillars and design principles
- Understand high availability and reliability

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- Describe the business impact of design decisions
- Describe how to set up an organizational structure to simplify billing and account visibility
- Identify alternative support options and features

Duration

Approximately 20-30 hours. When delivered synchronously by an educator, total duration is 28.5 hours. Digital training modules total seven hours in duration. 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

Delivery Methods

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

Educator Prerequisites

Educators must hold a current AWS Certified Cloud Practitioner certification to teach this course.

Educator Accreditation

Educators meeting the prerequisites have no further accreditation requirements.

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.

		Slides	Digital Training	Lab	Knowledge Check
Course Introduction		48	18 min.		
Video	Introduction to AWS Academy Cloud Foundations				
Digital Training	Welcome to AWS Academy Cloud Foundations				
Lecture	Course Overview and Objectives				
Lecture	Creating your AWS Training Portal Account				
Lecture	Access Your Course Materials				
Module 1 – Cloud Concepts					
Section 1: Cloud Concepts Overview		46	32 min.		10 min.
Video	Introduction to Cloud Computing				
Lecture	What is Cloud Computing?				
Digital Training	What is Cloud Computing?				
Lecture	Six Advantages of Cloud Computing				
Lecture	What is Amazon Web Services (AWS)				
Lecture	The AWS Cloud Adoption Framework (CAF)				
Knowledge Check	Cloud Concepts				
Section 2: Cloud Economics		33	32 min.		10 min.
Lecture	Fundamentals of Pricing				
Lecture	Total Cost of Ownership				
Digital Training	Introduction to Cloud Economics				
Knowledge Check	Cloud Economics				
Section 3: AWS Global Infrastructure Overview		18	13 min.		10 min.
Video	Introduction to the AWS Infrastructure				
Lecture	AWS Global Infrastructure				
Digital Training	Introduction to the AWS Infrastructure				
Lecture	AWS Service and Service Category Overview				
Knowledge Check	AWS Global Infrastructure				
Module 2 – AWS Core Services					
Video	Introduction to Core Services				
Section 1: Compute		67	45 min.		10 min.
Video	Introduction to Compute				
Lecture	Compute Services Overview				
Lecture	Introduction to Amazon Elastic Compute Cloud (EC2)				
Digital Training	Introduction to Compute				
Video	Amazon EC2 Console Demo				
Lab	Introduction to Amazon EC2				
Lecture	Amazon EC2 Cost Optimization				
Lecture	Introduction to AWS Lambda				
Lecture	Introduction to AWS Elastic Beanstalk				
Knowledge Check	Compute Services				
Section 2: Storage		55	40 min.		10 min.
Video	Introduction to Storage				

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Digital Training	Introduction to Storage				
Lecture	Amazon Elastic Block Store (EBS)				
Video	Amazon EBS Demo				
Lab	Working with EBS				
Lecture	Amazon Simple Storage Service (S3)				
Video	Amazon S3 Demo				
Lecture	Amazon Elastic File System (EFS)				
Video	Amazon EFS Demo				
Lecture	Amazon Glacier				
Video	Amazon Glacier Demo				
Knowledge Check	Storage Services				
Section 3: VPC		37	25 min.	45 min.	10 min.
Video	Introduction to the Amazon Virtual Private Cloud (VPC)				
Lecture	Amazon Virtual Private Cloud (VPC)				
Lecture	Amazon VPC Security Groups				
Video	Amazon VPC Demo				
Lab	Build your VPC and Launch a Web Server				
Lecture	Amazon CloudFront				
Knowledge Check	Amazon Virtual Private Cloud				
Section 4: Database		54	36 min.	45 min.	10 min.
Lecture	Amazon Relational Database Service (RDS)				
Video	Amazon RDS Demo				
Lecture	Amazon DynamoDB				
Video	Amazon DynamoDB Demo				
Lecture	Amazon Redshift				
Lecture	Amazon Aurora				
Lab	Build Your DB Server and Interact with Your DB Using an App				
Knowledge Check	Databases Services				
Section 5: Balancing, Scaling, Monitoring		39	25 min.	45 min.	10 min.
Lecture	Elastic Load Balancing (ELB)				
Lecture	Amazon CloudWatch				
Lecture	Auto Scaling				
Digital Training	Balancing, Scaling, and Monitoring				
Lab	Scale and Load Balance Your Architecture				
Knowledge Check	Balancing, Scaling, and Monitoring				
Module 3 – Cloud Security		91	70 min.	30 min.	10 min.
Video	Introduction to Cloud Security				
Lecture	AWS Shared Responsibility Model				
Lecture	AWS Identity and Access Management (IAM)				
Video	IAM Demo				
Lecture	AWS Trusted Advisor				
Lecture	AWS CloudTrail				
Lecture	AWS Config				
Lecture	AWS Day One Best Practice Review				
Lecture	AWS Security and Compliance Programs				
Lecture	AWS Security Resources				
Digital Training	AWS Cloud Security				
Lab	Introduction to AWS IAM				

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Demonstration	IAM Demonstration (optional)				
Knowledge Check	Cloud Security				
Module 4 – Cloud Architecting		49	37 min.		10 min.
Video	Introduction to Cloud Architecting				
Lecture	Introduction to the Well-Architected Framework				
Lecture	Well-Architected Design Principles				
Lecture	Understanding Reliability and High Availability				
Example	Transitioning a Data Center to the Cloud				
Digital Training	Introduction to Cloud Architecting				
Knowledge Check	Cloud Architecting				
Module 5 – Cloud Support		33	22 min.		10 min.
Lecture	Introduction to AWS Organizations				
Lecture	AWS Cost Explorer				
Lecture	Overview of AWS Technical Support Plans and Costs				
Digital Training	Cloud Billing and Support				
Knowledge Check	Cloud Billing and Support				
Recommended and Optional					
Lab	Sandbox				

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Appendix - Module Objectives

Module 0 - Welcome to AWS Academy (48 slides, 18 min.)

In this module, we are going to provide a course overview and review the course objectives. We will walk through the creation of your AWS training portal account and show you how to access the course materials. Two optional sections have been included that illustrate how to create your AWS Free Tier and AWS Educate accounts.

Upon completing this module, students will be able to:

- Review course objectives and a course overview of what is contained in the Academy Cloud Foundations curriculum.
- Create AWS accounts that will enhance your cloud-learning journey.

Module 1.1 - Cloud Concepts Overview

In this module, we will discuss the basics of cloud computing. You will learn what cloud computing is and discover the six advantages of cloud computing. We will reveal what Amazon Web Services is, as well as the AWS Cloud Adoption Framework. This course assumes you have a non-IT background, as it will not teach you how to build applications in the cloud. This course will give you a general conceptual understanding about the cloud and AWS.

Upon completing this module, students will be able to:

- Define different types of cloud computing to understand internet-based computing and three categories of cloud computing.
- Describe the six advantages of cloud computing, helping organizations make the decision to get out of the low-value parts of IT and focus on what drives business success.
- Describe three cloud deployment models for alternative models of cloud usage.
- Review the AWS Cloud Adoption Framework which helps organizations understand how cloud adoption transforms the way they work.

Module 1.2 - Cloud Economics

This module reviews the economics of cloud computing. You will be introduced to the fundamentals of pricing, and we will review the total cost of ownership.

Upon completing this module, students will be able to:

- Understand the AWS pricing philosophy.
- Review fundamental pricing characteristics.
- Understand the elements of Total Cost of Ownership.

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Module 1.3 - AWS Infrastructure Overview

The goal of this module is to understand the AWS global infrastructure and the types of services that are available. We will examine the AWS Global Infrastructure to gain a clear understanding of what the infrastructure includes, and understand the differences between AWS Regions, Availability Zones, and Edge Locations.

Upon completing this module, students will be able to:

- Examine the AWS global infrastructure
- Understand the difference between AWS Regions, Availability Zones, and Edge Locations

Module 2.1 - AWS Core Services: Compute

Amazon Web Services provides multiple services to build out a solution. Some of these services provide the foundation to all solutions. We refer to these as the core services. In this module, we provide insight into the offerings of each service category and look at our first group of services, compute.

Upon completing this module, students will be able to:

- Understand the different AWS compute services available in the cloud to power your solution
- Discover an in-depth review of Amazon Elastic Compute Cloud
- Explain AWS Lambda, which is serverless computing
- Review AWS Elastic Beanstalk

Module 2.2 - AWS Core Services: Storage

Cloud storage is typically more reliable, scalable, and secure than traditional on-premises storage systems. Cloud storage is a critical component of cloud computing, holding the information used by applications. Big data analytics, data warehouses, Internet of Things databases, and backup and archive applications all rely on some form of data storage architecture. In this module, we will explore Amazon Elastic Block Store, Amazon Simple Storage Service, Amazon Elastic File System, and Amazon Glacier

Upon completing this module, students will be able to:

- Discuss storage services including Amazon EBS, Amazon S3, Amazon EFS, and Amazon Glacier
- Review use cases for storage options, along with a demonstration of Amazon Glacier
- Understand storage pricing

Module 2.3 - AWS Core Services – Amazon Virtual Private Cloud

The Amazon Virtual Private Cloud is a custom-defined network within the AWS Cloud. It enables you to design and implement an independent network that operates in the cloud. We will understand the features and benefits of Amazon VPC, review Amazon VPC Security Groups and learn about Amazon CloudFront, a global Content Delivery Network service that securely delivers data, videos, applications, and APIs to your viewers with low latency and high transfer speeds.

Upon completing this module, students will be able to:

- Understand virtual networking in the cloud with Amazon VPC
- Create virtual firewalls with security groups
- Secure delivery of data, videos, applications, and APIs with Amazon CloudFront

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Module 2.4 - AWS Core Services: Databases

The business world is constantly changing and evolving. By accurately and efficiently recording, updating, and tracking data on regular basis, companies can leverage the immense potential of the insights obtained from their data. Database management systems are crucial for managing this data. Like other cloud services, cloud databases offer significant cost advantages over traditional database strategies. We will review the Amazon Relational Database Service, Amazon DynamoDB, Amazon Redshift, and Amazon Aurora. You will complete a lab to build your DB server and interact with your database using the app.

Upon completing this module, students will be able to:

- Provide an overview of different database services in the cloud
- Highlight the difference between unmanaged and managed database solutions
- Understand the differences between Structured Query Language and NoSQL databases
- Review the availability differences of alternative database solutions

Module 2.5 - AWS Core Services: Elastic Load Balancing, Amazon CloudWatch, and Auto Scaling

AWS Core Services includes Elastic Load Balancing, Amazon CloudWatch, and Auto Scaling. In this module, you will learn how each of these services work both independently and together to help you deploy highly available and optimized workloads on AWS. You will complete a lab to scale and load balance your architecture.

Upon completing this module, students will be able to:

- Learn how to distribute traffic across Amazon Elastic Compute Cloud instances using Elastic Load Balancing
- Discover the ability of Auto Scaling to launch and release servers in response to workload changes
- Realize how CloudWatch enables you to monitor AWS resources and applications in real time

Module 3 - AWS Cloud Security

This module will familiarize you with all of the security considerations for your cloud solution. We will review security tools and best practices to help you understand key security concepts related to the Shared Responsibility Model and IAM.

Upon completing this module, students will be able to:

- Describe the AWS Shared Responsibility Model
- Examine IAM users, groups, and roles
- Describe different types of security credentials
- Review the AWS Trusted Advisor checks
- Discuss security compliance
- Understand best practices on day 1 with a new AWS account

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Module 4 - Cloud Architecting

The goal of this module is to introduce you to some foundational cloud architecting concepts. Architecture is the art and science of designing and building large structures. We will review and understand the well-architected framework and associated design. This knowledge will help you begin to understand how to create a well-architected cloud solution.

Upon completing this module, students will be able to:

- Explore the well-architected pillars and design principles
- Understand high availability and reliability
- Understand the business impact of design decisions

Module 5 - Cloud Billing and Support

This module was designed to provide an overview of AWS billing and support services. We will review AWS Organizations, which helps you manage multiple AWS accounts and consolidated billing. We will also look at tools that enable you to view and estimate costs. Finally, we will close with a look at how to find AWS whitepapers and documentation on all AWS services, features, and resources.

Upon completing this module, students will be able to:

- Understand how to set up an organizational structure that simplifies billing and account visibility to review cost data
- Identify alternative support options and features