

# Course Outline

## AWS Academy Cloud Foundations

### Course Contents

This table includes all course content and activities with suggested durations.

	Lecture	Activity	Total
<b>DAY 1</b>			
<b>Course Introduction</b>	<b>35 min.</b>		<b>35 min.</b>
<i>Lecture or Video</i>	<i>Introduction</i>		
<b>Module 1 – Cloud Concepts Overview</b>	<b>45 min.</b>	<b>15 min.</b>	<b>60 min.</b>
<i>Lecture or Video</i>	<i>Introduction to Cloud Computing</i>		
<i>Lecture or Video</i>	<i>Advantages of the Cloud</i>		
<i>Lecture or Video</i>	<i>Introduction to AWS</i>		
<i>Lecture or Video</i>	<i>Moving to the AWS Cloud</i>		
<i>Lecture or Video</i>	<i>Wrap Up</i>		
<i>Activity</i>	<i>Sample Exam Question</i>	5 min.	
<i>Knowledge Check</i>	<i>Cloud Concepts</i>	10 min.	
<b>Module 2 – Cloud Economics and Billing</b>	<b>45 min.</b>	<b>55 min.</b>	<b>100 min.</b>
<i>Lecture or Video</i>	<i>Introduction</i>		
<i>Lecture or Video</i>	<i>Fundamentals of Pricing</i>		
<i>Lecture or Video</i>	<i>Total Cost of Ownership</i>		
<i>Activity</i>	<i>Simple Monthly Calculator</i>	20 min.	
<i>Lecture or Video</i>	<i>Delaware North Case Study</i>		
<i>Lecture or Video</i>	<i>AWS Organizations</i>		
<i>Lecture or Video</i>	<i>AWS Billing &amp; Cost Management</i>		
<i>Educator Demo</i>	<i>Billing Dashboard</i>	10 min.	
<i>Lecture or Video</i>	<i>Technical Support Models</i>		
<i>Activity</i>	<i>Support Plan Scavenger Hunt</i>	10 min.	
<i>Lecture or Video</i>	<i>Wrap-Up</i>		
<i>Activity</i>	<i>Sample Exam Question</i>	5 min.	
<i>Knowledge Check</i>	<i>Cloud Billing Economics</i>	10 min.	
<b>Module 3 – AWS Global Infrastructure Overview</b>	<b>25 min.</b>	<b>45 min.</b>	<b>70 min.</b>
<i>Lecture or Video</i>	<i>Introduction</i>		
<i>Lecture or Video</i>	<i>AWS Global Infrastructure</i>		
<i>Educator Demo</i>	<i>AWS Global Infrastructure</i>	10 min.	
<i>Lecture or Video</i>	<i>AWS Services &amp; Service Categories</i>		
<i>Activity</i>	<i>AWS Management Console Clickthrough</i>	20 min.	
<i>Lecture or Video</i>	<i>Wrap Up</i>		
<i>Activity</i>	<i>Sample Exam Question</i>	5 min.	
<i>Knowledge Check</i>	<i>AWS Infrastructure</i>	10 min.	
<b>Module 4 – Cloud Security</b>	<b>45 min.</b>	<b>70 min.</b>	<b>115 min.</b>
<i>Lecture or Video</i>	<i>Introduction</i>		
<i>Lecture or Video</i>	<i>AWS Shared Responsibility Model</i>		
<i>Activity</i>	<i>AWS Shared Responsibility Model</i>	10 min.	
<i>Lecture or Video</i>	<i>AWS IAM</i>		
<i>Video Demo</i>	<i>AWS IAM Console Demonstration</i>	5 min.	

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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			
Lecture or Video	Wrap Up			
Activity	Sample Exam Question		5 min.	
Knowledge Check	Cloud Security		10 min.	
<b>DAY 2</b>				
<b>Module 5 – Networking and Content Delivery</b>		<b>60 min.</b>	<b>70 min.</b>	<b>130 min.</b>
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 Your 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.	
<b>Module 6 – Compute</b>		<b>80 min.</b>	<b>145 min.</b>	<b>225 min.</b>
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.	
<b>Module 7 – Storage</b>		<b>45 min.</b>	<b>85 min.</b>	<b>130 min.</b>
Lecture or Video	Introduction			

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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	
Lecture or Video	Wrap Up			
Activity	Sample Exam Question		5 min.	
Knowledge Check	Storage		10 min.	
<b>DAY 3</b>				
<b>Module 8 – Databases</b>		<b>60 min.</b>	<b>70 min.</b>	<b>130 min.</b>
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.	
<b>Module 9 – Cloud Architecture</b>		<b>40 min.</b>	<b>75 min.</b>	<b>115 min.</b>
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.	

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<i>Knowledge Check</i>	<i>Cloud Architecture</i>		<i>10 min.</i>	
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<b>Module 10 – Automatic Scaling and Monitoring</b>		<b>35 min.</b>	<b>55 min.</b>	<b>90 min.</b>
<i>Lecture or Video</i>	<i>Introduction</i>			
<i>Lecture or Video</i>	<i>Elastic Load Balancing</i>			
<i>Activity</i>	<i>Elastic Load Balancing</i>		<i>5 min.</i>	
<i>Lecture or Video</i>	<i>Amazon CloudWatch</i>			
<i>Activity</i>	<i>Amazon CloudWatch</i>		<i>5 min.</i>	
<i>Lecture or Video</i>	<i>Amazon EC2 Auto Scaling</i>			
<i>Lab Exercise</i>	<i>Scale &amp; Load Balance your Architecture</i>		<i>30 min.</i>	
<i>Lecture or Video</i>	<i>Wrap Up</i>			
<i>Activity</i>	<i>Sample Exam Question</i>		<i>5 min.</i>	
<i>Knowledge Check</i>	<i>Autoscale</i>		<i>10 min.</i>	
<b>Optional</b>				
<i>Lab</i>	<i>Sandbox</i>			

# Course Outline

## AWS Academy Cloud Foundations

### Module Objectives

Module: 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 Foundations*
- *Recognize 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*
- *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*

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## AWS Academy Cloud Foundations

### 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



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### Module 8: Databases

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

### Module 10: Automatic Scaling and Monitoring

The purpose of this module is to introduce students to three fundamental AWS services – Elastic Load Balancing, 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