

Course Outline

AWS Academy Introduction to Cloud: Semester 2

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Course Version

This course outline applies to version 1.0 of *AWS Academy Introduction to Cloud: Semester 2* in English.

Description

AWS Academy Introduction to Cloud: Semester 2 is an exploration of cloud computing. In this course, students explore cloud computing services, applications, and use cases. Students dive into cloud computing best practices and learn how cloud computing helps users develop a global infrastructure to support use cases at scale while also developing and inventing innovative technologies.

This course is an extension of *AWS Academy Introduction to Cloud: Semester 1*. The course provides students with classroom instruction that introduces cloud computing skills and accelerates students toward the next steps in their educational journey. The content of this course is aligned to the [K-12 Computer Science Framework Practices](#) including computational thinking. The seven core practices of computer science describe the behaviors and ways of thinking that computationally literate students use to fully engage in today's data-rich and interconnected world.

Course Objectives

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

- Describe what the AWS Cloud is and the basic global infrastructure
- Describe basic AWS Cloud architectural principles
- Describe the AWS Cloud value proposition
- Describe key services on the AWS platform and their common use cases (for example, compute and analytics)
- Use key services in lab activities for hands-on practice, including but not limited to the following:
 - Amazon Simple Storage Service (Amazon S3)
 - Amazon CloudFront
 - AWS Lambda
 - Amazon Elastic Compute Cloud (Amazon EC2)
 - Amazon Virtual Private Cloud (Amazon VPC)
 - Amazon Comprehend
 - AWS DeepRacer
 - AWS CloudFormation

Duration

The course duration is approximately 60 hours and designed to be delivered synchronously by an educator.

Intended Audience

This is an introductory-level course intended for students of AWS Academy member institutions who seek an overall understanding of cloud computing skills.

Student Prerequisites

It is highly recommended that students complete *AWS Academy Introduction to Cloud: Semester 1* prior to this course.

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

- General IT technical knowledge
- General IT business knowledge

Delivery Methods

Learning materials are provided to support synchronous, instructor-led delivery in person or online.

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, participate in an AWS “Ready-to-Teach” Webinar Series, and facilitate the *AWS Academy Introduction to Cloud: Semester 1* course.

This course utilizes the AWS Academy Learner Labs environment to provide students with hands-on practical lab activities that utilize AWS services to explore and build cloud technologies. Educators are recommended to familiarize themselves with the lab environment.

Learning Resources

- Educator guide
- Student guide
- Activity worksheets
- Lab exercises
- Module quizzes
- End-of-course assessment

Course Contents

The following table includes all course content and activities with suggested durations.

Unit 1: Managing Efficiency and Security	3 weeks
Module 1: AWS Security Models	
Lecture and discussion	50 minutes
Activity: Whose Responsibility Is It?	25 minutes
Module quiz	15 minutes
Module 2: Shared Security	
Lecture and discussion	50 minutes
Activity: Resolving Security Threats	30 minutes
Activity: Comparing Trusted Advisor and Amazon Inspector	30 minutes
Module quiz	15 minutes
Module 3: Cloud Services and Instance States	
Lecture and discussion	50 minutes
Activity: Instance and Animal Lifecycles	25 minutes
Activity: Most Likely Instance State	20 minutes
Activity: Which Instance Billing Option Is the Most Cost-Efficient?	25 minutes
Module quiz	15 minutes
Unit 2: Creating Cloud Environments to Scale	4 weeks
Module 4: Dynamic Web Servers I	
Lecture and discussion	50 minutes
Activity: Static or Dynamic?	45 minutes
Lab: Setting Up a Static Website	30 minutes
Module quiz	15 minutes
Module 5: Dynamic Web Servers II	
Lecture and discussion	50 minutes
Activity: Reviewing CloudFront Distributions	30 minutes
Lab: Creating a CloudFront Distribution	40 minutes
Module quiz	15 minutes
Module 6: Lambda	
Lecture and discussion	50 minutes
Activity: Instance Lifecycles	20 minutes
Activity: Instance State Situations	20 minutes
Activity: Instance Purchasing Scenarios	30 minutes
Lab: Creating a Lambda Function	30 minutes
Module quiz	15 minutes

Module 7: Auto Scaling in Cloud Environments	
Lecture and discussion	50 minutes
Activity: Developing a Plan to Monitor Auto Scaling Groups	60 minutes
Lab: Creating Launch Templates and Auto Scaling Groups	45 minutes
Module quiz	15 minutes
Unit 3: Emerging Technology	6 weeks
Module 8: Artificial Intelligence Capabilities	
Lecture and discussion	50 minutes
Activity: Selecting the Best AI Product	30 minutes
Activity: Using AI to Solve Issues	30 minutes
Lab: Using AI for Text Analysis	50 minutes
Module quiz	15 minutes
Module 9: Impact of Artificial Intelligence	
Lecture and discussion	50 minutes
Activity: Debating AI in Society	60 minutes
Activity: Using AI in Today's World	30 minutes
Module quiz	15 minutes
Module 10: Machine Learning	
Lecture and discussion	50 minutes
Activity: Machine Learning Scenarios	45 minutes
Lab: Reinforcement Learning with AWS DeepRacer	40 minutes
Module quiz	15 minutes
Module 11: AWS Machine Learning Applications	
Lecture and discussion	50 minutes
Activity: Using Machine Learning in My Business	45 minutes
Activity: Deep Learning Case Studies	45 minutes
Module quiz	15 minutes
Module 12: Internet of Things	
Lecture and discussion	50 minutes
Activity: Visual Representation of the IoT	30 minutes
Activity: IoT Skit	80 minutes
Module quiz	15 minutes
Module 13: CloudFormation Templates	
Lecture and discussion	50 minutes
Activity: Getting to Know CloudFormation	45 minutes
Lab: Creating an Environment with CloudFormation	60 minutes
Module quiz	15 minutes

Unit 4: Big Data and Cryptocurrency	3 weeks
Module 14: Big Data	
Lecture and discussion	50 minutes
Activity: Introduction to Big Data	30 minutes
Activity: Big Data Pros and Cons	60 minutes
Module quiz	15 minutes
Module 15: Big Data Processing Cycle	
Lecture and discussion	50 minutes
Activity: Introduction to the Big Data Processing Cycle	45 minutes
Activity: Big Data Processing Cycle Challenges	45 minutes
Module quiz	15 minutes
Module 16: Blockchain and Cryptocurrency	
Lecture and discussion	50 minutes
Activity: Blockchain Improv	60 minutes
Activity: Exploring Blockchain Solutions	45 minutes
Module quiz	15 minutes
End-of-Course Assessment	45 minutes

Module Objectives

The following table includes course objectives for each module.

Module Title	Learning Objectives
Module 1: AWS Security Models	<ul style="list-style-type: none"> Describe the shared responsibility model Differentiate between client and AWS security responsibilities for components of AWS Cloud architecture
Module 2: Shared Security	<ul style="list-style-type: none"> Explain the role of AWS Trusted Advisor and Amazon Inspector in providing cloud security Compare Amazon Inspector and Trusted Advisor List the steps required to resolve a Trusted Advisor security alert
Module 3: Cloud Services and Instance States	<ul style="list-style-type: none"> Describe the six instance states Diagram the transitions between instance states from launch to termination Indicate instance usage billing for each instance state Determine the optimal instance state for a given situation
Module 4: Dynamic Web Servers I	<ul style="list-style-type: none"> Recall the process for setting up a static website Compare static and dynamic websites
Module 5: Dynamic Web Servers II	<ul style="list-style-type: none"> Create an Amazon CloudFront distribution to increase the speed of your website
Module 6: Lambda	<ul style="list-style-type: none"> Recall the process for deploying a function using the AWS Lambda console Create a Lambda function using the Lambda console

Module Title	Learning Objectives
Module 7: Auto Scaling in Cloud Environments	<ul style="list-style-type: none"> • Recognize the three main functions of AWS Auto Scaling • Create a launch template and an Auto Scaling group • Develop a plan for monitoring an Auto Scaling instance or group
Module 8: Artificial Intelligence Capabilities	<ul style="list-style-type: none"> • Recognize capabilities of artificial intelligence (AI) • Determine an AI product that would help address a need or problem in a given situation
Module 9: Impact of Artificial Intelligence	<ul style="list-style-type: none"> • Appraise the value of emerging AI technology • Analyze the ethical implications of AI
Module 10: Machine Learning	<ul style="list-style-type: none"> • Recognize use cases for machine learning (ML) • Explain how ML can help address a need or problem in a given situation • Create an ML algorithm
Module 11: AWS Machine Learning Applications	<ul style="list-style-type: none"> • Evaluate how AI and ML support deep learning • Evaluate how AI and ML support enterprise and business intelligence
Module 12: Internet of Things	<ul style="list-style-type: none"> • Define Internet of Things (IoT) • Explain the relationship between cloud technology and the IoT • Determine how IoT products or services can address a given need or problem • Examine AWS customer stories to determine IoT use cases
Module 13: CloudFormation Templates	<ul style="list-style-type: none"> • Explain the functions of the AWS CloudFormation service • Determine the configuration of services by examining a CloudFormation template • Develop a CloudFormation template that addresses a given user need
Module 14: Big Data	<ul style="list-style-type: none"> • Define big data • Identify use cases for big data in various industries • Evaluate the pros and cons of big data
Module 15: Big Data Processing Cycle	<ul style="list-style-type: none"> • Define key terms related to big data processing • Describe the big data processing cycle
Module 16: Blockchain and Cryptocurrency	<ul style="list-style-type: none"> • Define blockchain and cryptocurrency • Explain how a blockchain ensures the validity and immutability of transactions • Explain how blockchain functions in the cloud • Evaluate the pros and cons of cryptocurrency • Evaluate the pros and cons of blockchain business applications