AWS CLOUD INSTITUTE

AWS Cloud Institute: Introduction to Cloud Foundations Syllabus

Course Overview
In Introduction to Cloud Foundations ("ICF") you will develop foundational understanding of the AWS Cloud, independent of any specific technical role. You will learn about AWS Cloud concepts, core AWS services, security, architecture, pricing, and support to build your AWS Cloud knowledge. This course will also help you prepare for the AWS Certified Cloud Practitioner exam.

Course Structure
ICF is a combination of digital e-learning content ("modules") that you can read, watch, and engage with on your own time (asynchronous content) and instructor-led training sessions (ILTs) that focus on the topics presented in the asynchronous content.

ICF modules are covered over the course of 11 weeks and include approximately 85 hours of text, video, audio, hands-on learning activities, and knowledge checks (see Table 1). There are over a dozen ILT sessions offered each week that can be watched live or on-demand. Although ILT attendance is not required for course completion, each session is an opportunity to connect with and learn from your AWS instructor and other ICF students.

As with all AWS Cloud Institute courses, the expectation is that you will complete your modules and associated assessments on a weekly basis. You also have the option to attend the ILTs live or watch the recorded version that will be posted online after each session. Taking advantage of this "flipped classroom" method is the best way to ensure that you develop the professional and technical skills required to be successful as a cloud application developer.

Course Sessions

Table 1. ICF Module Overview by Content Type

	Content Type	Percentage of total course time (by hours)
1	e-learning (text, video, audio)	~50% (42 hours)
2	Ungraded (formative) knowledge checks	~11% (9 hours)
3	Ungraded activities (games, case studies, simulations)	~12% (10 hours)
4	Hands-on learning activities (labs, activities and/or AWS Jam challenges)	~14% (12 hours)
5	Graded (summative) assessments	~13% (11 hours)
6	**Total Time**	**100% (84 hours)**

Instructor-Led Training (ILT) Sessions

Mondays:	Weekly Stand-Up, 10:00AM, 11:30AM, 1:30PM & 3:30PM EST
Tuesdays:	Weekly Spotlight, 10:00AM, 11:30AM, 1:30PM & 3:30PM EST
Wednesdays:	Weekly Focus Session, 10:00AM, 11:30AM, 1:30PM & 3:30PM EST
Thursdays:	Weekly Labology Session, 10:00AM, 11:30AM, 1:30PM & 3:30PM EST
Fridays:	Weekly Fun Friday Event, 11:30AM EST
M, T, W, Th:	Office Hours, 8:30 AM, 10:00 AM, 05:00 PM, & 06:30 PM EST

All ILT sessions, with the exception of office hours, are recorded and will be available on-demand for you to watch when you have time. Multiple live ILT sessions are offered each day to accommodate a range of schedules. All ILT sessions, with the exception of Fun Friday events, are also offered on a PST schedule (i.e., Weekly Stand-Up 8:30AM, 10:30AM & 12:30PM PST).

Prerequisites
N/A

Assessment and Grading Policy
ICF is offered as a "pass/fail" course (no letter grades). You will be required to achieve a passing score of 85% or higher on all weekly summative assessments to successfully complete ICF. There is a total of ten (10) summative assessments in this course. Each summative assessment will take the form of a 20-question multiple choice quiz presented at the end of your assigned modules each week. You will have unlimited opportunities to achieve a passing score on each summative assessment.

Attendance at ILT sessions is strongly encouraged but will not count towards course completion. You should use the ILT sessions to explore concepts that were presented in your e-learning in greater depth, connect with your AWS instructors and fellow ACI learners, and prepare for the weekly summative assessment.

Course Completion Requirements
All learners must complete ten (10) weekly summative assessments with a score of 85% or higher to receive credit for ICF. ILT attendance or watching ILT recordings is strongly encouraged but is not required for course completion.

Week 1: Introduction to Computer Technology & Cloud Introduction (Part 1)

Goal:
Prepare to build more advanced knowledge in cloud computing by gaining a baseline understanding of computer technology, such as how a computer works, legacy IT infrastructure, and virtualization.

Learning Objectives:
- Explain how a computer functions and how data is stored
- Explain the basics of securing data
- Explain the OSI model and the basics of networking
- Explain virtualization and its main use cases
- Explain the basics of IT infrastructure

Module Outline:
1. **What is a Computer**
    a. Introduction: What is a Computer?
    b. Core Components of a Computer
    c. From User Input to Action
    d. Data Measurements
    e. Storage on Computers
    f. Knowledge Check
2. **Security Basics**
    a. Introduction: Security Basics
    b. Authentication and Authorization
    c. Encryption
    d. Knowledge Check
3. **Networking Basics**
    a. Introduction: Networking Basics
    b. Introduction to the OSI model
    c. Communicating on a Network
    d. Devices on the Network
    e. Knowledge Check
4. **Virtualization Basics**
    a. Introduction: Virtualization
    b. Virtualization
    c. Containers

   d. Knowledge Check
5. **Basic IT Infrastructure**
   a. Introduction: Basic IT infrastructure
   b. Information Flow
   c. Three-Tier Architecture
   d. Knowledge Check

Activities:

- N/A

Videos (Time total: N/A):

- N/A

Ungraded Assessments (Formative):

These ungraded assessments establish the learner's pre-existing knowledge of the content, and are designed to review basic information about computing, digital security, and IT infrastructure.

Graded Assessment:

No graded assessment for Week 1: Part 1.

Week 1: Cloud Introduction: What Is Cloud Computing? (Part 2)

Goal:

Develop knowledge of the essential concepts of cloud computing and the AWS Infrastructure. Learners will be able to explain the benefits of using AWS products and services for business solutions.

Learning Objectives:

- Define cloud computing
- Articulate cloud computing benefits
- Classify the cloud service models and the cloud deployment models
- Explain the benefits of the AWS Cloud Adaption Framework (AWS CAF)
- Identify how AWS CAF is used in a business setting

Module Outline:

1. **Introduction: What is Cloud Computing?**
   a. A Brief History of Cloud Computing & AWS
   b. What is the Cloud?
   c. Why do Organizations Use Cloud Computing?
   d. How is the Cloud Implemented in Organizations?
   e. What is the AWS Cloud Adoption Framework?
   f. Knowledge Check
   g. Summary

Activities:

- **Business Simulation**
  - Help AnyCompany use the AWS CAF for their cloud adoption journey in this interactive Storyline activity.

Videos (Total Time 28:47):

- What is Cloud Computing? (3:22)
- Rivian Case Study with AWS (23:25)
- Three Cloud Service Models (1:55)

Ungraded Assessments (Formative):
These ungraded assessments establish the learner's pre-existing knowledge of the content, and are designed to review basic information about cloud computing, cloud implementation, and the AWS Cloud Adoption Framework.

Graded Assessment:
The graded assessment will cover basic information about cloud integration, adoption, and the AWS CAF.

Week 2: Cloud Introduction (Continued)

Goal:
Build an understanding of the essential concepts of cloud computing and the AWS Infrastructure. Explain the benefits of using AWS for business solutions.

Learning Objectives:
- Discuss the AWS global infrastructure
- Identify the core AWS services and the specialized AWS services
- Identify resources for technology support
- Describe AWS access management capabilities

Module Outline:
1. **Cloud Introduction: AWS Infrastructure**
    a. Introduction: AWS Infrastructure
    b. Regions, Availability Zones, and Edge Locations
    c. AWS Outposts
    d. AWS Local Zones
    e. Knowledge Check
2. **Cloud Introduction: AWS Service Domains and Services**
    a. Introduction: AWS Service Domains and Services
    b. Core AWS Services
    c. Specialized AWS Services
    d. Knowledge Check
3. **Cloud Introduction: Features for Accessing AWS and AWS IAM**
    a. Introduction: Features for Accessing AWS Services
    b. Web APIs
    c. AWS Command Line Interface (AWS CLI)
    d. AWS Management Console
    e. Lab: Navigating the AWS Management Console
    f. AWS SDKs
    g. Knowledge Check
    h. Summary
    i. Introduction: AWS Identity and Access Management
    j. What is IAM?
    k. IAM Identities (Users, Groups, and Roles)
    l. Access and Permissions
    m. Knowledge Check
4. **Cloud Introduction: Technology Support**
    a. Introduction: AWS Technology Support
    b. Where to Find Technology Support?
    c. AWS Support Plans
    d. AWS Trusted Advisor
    e. AWS Partner Network and AWS Marketplace
    f. AWS Abuse Support
    g. Specialized Support
    h. Knowledge Check

Activities:

- **Lab: Navigating the AWS Management Console**
    - Log into AWS, locate the Management Console, and perform basic tasks

Videos (Total Time 45:47):

- AWS Global Infrastructure (3:03)
- Using Multiple Regions (1:48)
- Using Multiple Availability Zones (1:10)
- Benefits of Edge Locations (2:08)
- Benefits of Amazon CloudFront Edge Locations (2:30)
- Benefits of AWS Global Accelerator Edge Locations (3:18)
- What are AWS Outposts? (2:30)
- AWS Local Zones (1:38)
- What are Web APIs? (2:20)
- AWS Management Console Overview (00:35)
- Demo of Finding Python Documentation (00:40)
- AWS Identity and Access Management (1:24)
- AWS Account Root User (1:29)
- IAM Users (1:02)
- IAM Groups (1:22)
- IAM Roles (1:24)
- Authentication (2:12)
- Password Policy (1:33)
- Authorization and IAM Policies (3:01)
- Identity Federation (1:07)
- AWS Support Plans (3:43)
- AWS Trusted Advisor (2:44)
- AWS Abuse Support (2:06)

Ungraded Assessments (Formative):
These ungraded assessments establish the learner's pre-existing knowledge of the content, and are designed to review basic information about cloud infrastructure, domains and services, as well as AWS IAM, and where to locate support.

Graded Assessment:
The graded assessment will cover information about cloud infrastructure, AWS Domains and Services, AWS IAM, and how to access technical support.

Week 3: Architecting on AWS 1

Goal:
Gain foundational understanding of the Well-Architected Framework and AWS Trusted Advisor.

Learning Objectives:

- Articulate the six pillars of the Well-Architected Framework
- Define cloud architecture design principles
- Define the Well-Architected tool and its attributes
- Explain the value of the AWS Trusted Advisor
- Define continuous integration and continuous delivery and its benefits on AWS

Module Outline:

1. **Architecting on AWS 1: Cloud Architecture Best Practices**
    a. Introduction: Cloud Architecture Best Practices

   b. Well-Architected Framework
   c. Getting Started with the Well-Architected Framework
   d. AWS Cloud Architecture Design Principles
   e. Illustration of the Principles
   f. Designing for High Availability
   g. Knowledge Check
2. **Architecting on AWS 1: Cloud Architecture Tools**
   a. Introduction: Cloud Architecture Tools
   b. AWS WA Tool
   c. Trusted Advisor
   d. Lab: Using Trusted Advisor
   e. Knowledge Check
3. **Architecting on AWS 1: Cloud Architecture, Continuous Integration and Continuous Delivery**
   a. Introduction: Cloud Architecture, CI and CD
   b. Continuous Integration and Continuous Delivery
   c. CI/CD on AWS
   d. Knowledge Check

Activities:

- **Lab: Using Trust Advisor**
  - Use AWS Trusted Advisor to perform a basic security audit of your AWS resources. Use the AWS Console to modify Amazon EC2 Security Groups to meet best practices.

Videos (Total Time 19:44):

- Introduction to the AWS Well-Architected Framework (2:23)
- Cloud Architecture Design Principles (6:06)
- Reviewing Workloads (2:13)
- Reviewing Improvement Plans (1:05)
- Saving a Milestone (1:22)
- Generating Reports (00:48)
- AWS Trusted Advisor (5:47)

Ungraded Assessments (Formative):
These ungraded assessments establish the learner's pre-existing knowledge of the content, and are designed to review basic information about cloud architecture, continuous integration, and continuous delivery.

.

Graded Assessment:
The graded assessment will cover information around cloud architecture, continuous integration, and continuous delivery.

Week 4: Compute 1

Goal:
Gain foundational knowledge of AWS's compute services offered and the benefits of the EC2 service.

Learning Objectives:

- Describe the benefits of EC2 and the types of instances
- Define the instance lifecycle
- Identify the EC2 pricing models
- Describe the different types of scaling and explain the difference between scalability and elasticity
- Describe security features in EC2
- Describe storage features in EC2
- Define and discuss containers
- Define serverless compute

- Launch an EC2 instance using the console

Module Outline:

1. **Compute 1: Amazon EC2**
    a. Introduction: Amazon EC2
    b. Compute as a Service
    c. What is Amazon EC2?
    d. Amazon EC2 Storage
    e. Amazon Machine Images
    f. Amazon EC2 Lifecycle
    g. Amazon EC2 Scaling
    h. Amazon EC2 Instance
    i. Launching an EC2 Instance
    j. Connecting to an EC2 Instance
    k. Management, Maintenance, and Operations
    l. Lab: Launching an EC2 Instance
    m. Knowledge Check
2. **Compute 1: Containers on AWS**
    a. Introduction: Containers on AWS
    b. Container Images
    c. Container Services on AWS
    d. Amazon ECS
    e. Amazon ECR
    f. Amazon EKS
    g. Knowledge Check
3. **Compute 1: Serverless Computing on AWS**
    a. Introduction: Serverless Computing on AWS
    b. Lambda
    c. Fargate
    d. Knowledge Check

Activities:

- **Lab: Launching an EC2 Instance**
    - This lab guides you through the steps to launch, configure, access, and terminate an Amazon EC2 instance using the console.

Videos (Total Time 54:54):

- Introduction to Amazon Elastic Compute Cloud (4:50)
- Amazon EC2 Instance Types (1:07)
- Amazon EC2 Instance Lifecycle (4:32)
- Amazon EC2 Launch Types (5:38)
- Introduction to AWS Systems Manager Session Manager (5:26)
- Introduction to Containers (5:01)
- Container Services on AWS (3:20)
- Creation of an AWS ECS Cluster (11:26)
- Introduction to AWS Lambda (7:19)
- Choosing the Right Compute Service (7:48)

Ungraded Assessments (Formative):

These ungraded assessments establish the learner's pre-existing knowledge of the content, and are designed to review basic information about Amazon EC2 Instances, Container Services, and Serverless Computing.

Graded Assessment:

The graded assessment will cover information around creating, launching, and understanding an Amazon EC2 Instance, as well as identifying container services, and choosing the right compute service for a task.

Week 5: Databases 1

Goal:
Discuss database fundamentals, describe the database environment, choose the right database for a given situation, understand the benefits of different database types, and describe how to set up and configure an RDS instance.

Learning Objectives:
- Discuss foundational database concepts
- Describe when to use the main types of database paradigms
- Explain the structure of schemas and relational databases
- Describe the features and benefits of Amazon Relational Database Service (RDS)
- Use the console to set up an Amazon RDS instances
- Discuss how to migrate an on-premises database to an Amazon managed RDS

Module Outline:
1. **Databases 1: Foundational Database Concepts**
    a. Introduction: Foundational Database Concepts
    b. Database Structures, Terms, and Concepts
    c. Knowledge Check
2. **Databases 1: Database Paradigms**
    a. Introduction: Database Paradigms
    b. Relational Databases
    c. Nonrelational Databases
    d. Knowledge Check
3. **Databases 1: Amazon Relational Database Service (Amazon RDS)**
    a. Introduction: Amazon Relational Database Service (Amazon RDS)
    b. Amazon RDS Basics
    c. Multi-AZ Deployments, Read Replicas, and Backups
    d. Pricing Considerations
    e. Amazon Aurora
    f. Knowledge Check
4. **Databases 1: Using Amazon RDS**
    a. Introduction: Using Amazon RDS
    b. Database Management Methods
    c. Getting Started with Amazon RDS
    d. Connectivity and Scaling
    e. Lab: Introduction to Amazon RDS
    f. Knowledge Check
5. **Databases 1: Migrating to an Amazon Managed RDS**
    a. Introduction: Migrating to an Amazon Managed RDS
    b. Migrating Your Database to AWS
    c. Using AWS DMS to Migrate Data
    d. Using AWS SCT to Convert Data
    e. Knowledge Check

Activities:
- **Lab: Introduction to Amazon RDS**
    - In this lab, you will explore the selection and creation of an Amazon RDS instance, and you will connect and back up a database.

Videos (Total Time 8:16):
- Comparing OLTP and OLAP (2:01)

- Introduction to Amazon RDS (1:20)
- Amazon RDS Key Decision Points (1:44)
- Choosing Storage for your Amazon RDS Database (4:11)

Ungraded Assessments (Formative):
These ungraded assessments establish the learner's pre-existing knowledge of the content, and are designed to review basic information about database concepts, the Amazon RDS service, and migrating to an Amazon managed RDS.

Graded Assessment:
The graded assessment will cover information around creating, launching, and understanding database concepts, the Amazon RDS service, and what is needed to migrate to an Amazon managed RDS.

Week 6: Cost Management

Goal:
Describe the three AWS Cost Management drivers, identify the business needs of an organization, describe total cost of ownership (TCO) and how it's calculated, discuss pricing details for individual services, identify AWS payment models, use AWS Cost Explorer, use pricing tools to make cost effective choices for AWS services, and differentiate the AWS Support tiers.

Learning Objectives:
- Describe the AWS Cost Management drivers
- Identify the business needs of an organization
- Use AWS Cost Explorer
- Describe Total cost of ownership (TCO) and how it's calculated
- Discuss Pricing Details for Individual Services
- Recognize the various account structures in relation to AWS billing and pricing
- Differentiate AWS Support tiers

Module Outline:
1. **Cost Management: Business Needs and Cloud Strategy**
    a. Introduction: Identifying Your Business Needs
    b. Identifying Your Business Needs
    c. Introduction: Establishing a Cloud Strategy
    d. Understanding Cloud Financial Management
    e. Using AWS Pricing Calculator
    f. Planning for Data Transfer Charges
    g. Knowledge Check
2. **Cost Management: Cloud Cost Analyses and Tracking**
    a. Introduction: Cloud Cost Analyses and Tracking
    b. AWS Billing Console Overview
    c. AWS Purchase Order Management
    d. AWS Cost Management Console
    e. AWS Budgets
    f. Resource Tagging and Cost Optimization
    g. Demo – Using AWS Cost Explorer
    h. Knowledge Check
3. **Cost Management: Optimizing Cloud Costs**
    a. Introduction: Optimizing Cloud Costs
    b. AWS Pricing Models
    c. Rightsizing Compute Resources
    d. AWS Compute Optimizer
    e. Using AWS Credits
    f. Knowledge Check

4. **Cost Management: AWS Organizations**
    a. Introduction: AWS Organizations
    b. AWS Organizations Overview
    c. Knowledge Check
5. **Cost Management: AWS Support Plans**
    a. Introduction: AWS Support Plans
    b. AWS Support Plans Overview
    c. Knowledge Check

Activities:

- **Business Case Study** – Identify the benefits that the AWS cloud brings to a company's business model, including a specific case study example.

Videos (Total Time 30:50):

- Demo: AWS Pricing Calculator (9:32)
- Architecting for Cost: Networking (4:52)
- AWS Cost Management Tools Demo (7:07)
- AWS Organizations Overview (5:27)
- AWS Support Plans (3:52)

Ungraded Assessments (Formative):

These ungraded assessments establish the learner's pre-existing knowledge of the content, and are designed to review basic information about how a cloud strategy can meet business needs, how to analyze costs and track cloud usage, how to optimize for cost, and how to utilize AWS Support.

Graded Assessment:

The graded assessment will cover information around creating, launching, and understanding cloud costs, optimizations, and AWS Support options and plans for cloud-based infrastructure and solutions.

Week 7: Networking 1

Goal:

Discuss network fundamentals, identify different networking tools, understand various types of network connectivity, and set up a custom VPC.

Learning Objectives:

- Discuss general overview of networking concepts, types, equipment, and interconnectivity
- Discuss network mapping terminology and correlations within AWS
- Explain CIDR notation and how IP addresses are used to connect networks
- Explain methods of networking from on-premises data centers
- Discuss available core AWS networking services

Module Outline:

1. **Networking 1: Networking Fundamentals**
    a. Introduction: Networking Overview
    b. Compute Networks Overview
    c. Network Communications Overview
    d. Lab: Working with IP Addresses
    e. Subnetting
    f. What is the OSI Model?
    g. Networking on AWS
    h. Knowledge Check
2. **Networking 1: Networking in AWS**

a. Introduction: Networking in AWS
b. Amazon VPC Basics
c. Lab: Using Classless Inter-Domain Routing (CIDR)
d. VPC Networking Fundamentals
e. Lab: Routing and Internet
f. VPC Design Considerations
g. VPC Traffic Security
h. Lab: Security and EC2 Instances
i. DNS Operations in a VPC
j. Lab: Build a Fully Functioning VPC
k. Connecting VPCs with VPC Peering
l. Facilitating Cross-Service Communications with VPC Endpoints
m. Troubleshooting Your VPC
n. Knowledge Check

3. **Networking 1: AWS Networking Services Overview**
   a. Introduction: AWS Networking Services Overview
   b. Network Foundations Services
   c. Hybrid Connectivity Services
   d. Edge Fundamentals
   e. Edge Services
   f. Network Security Services
   g. Knowledge Check

Activities:

- **Lab: Working with IP Addresses**
  - In this lab, you will: 1) Test the public and private IP addresses for an Amazon EC2 instance, 2) Test the static and dynamic IP addresses for two Amazon EC2 instances.
- **Lab: Using Classless Inter-Domain Routing (CIDR)**
  - In this lab, you will: 1) Launch a VPC, 2) Allocate the correct CIDR block for the VPC, and 3) Check the subnet CIDR block that the VPC provisioned.
- **Lab: Routing and Internet**
  - In this lab, you will: 1) Launch a VPC, 2) Create subnets, 3) Create route tables, 4) Create and attach an internet gateway, and 5) Add a route to the internet to the route table.
- **Lab: Routing and Internet**
  - In this lab, you will: 1) Create a VPC with resources, 2) Create network access control lists (network ACLs), 3) Create security groups, 4) Launch Amazon Elastic Compute Cloud (Amazon EC2) instances, and 5) Test connectivity.

Videos (Total Time 33:44):

- Using CIDR Block Notation (5:18)
- Data Encapsulation Overview (3:35)
- AWS Networking Services Overview (4:29)
- Designing a Networking Solution using AWS (17:14)
- Introduction to Troubleshooting (00:48)

Ungraded Assessments (Formative):

These ungraded assessments establish the learner's pre-existing knowledge of the content, and are designed to review basic information about the fundamentals of networking, how to network in AWS, and the services available for networking within AWS.

Graded Assessment:

The graded assessment will cover information around networking with AWS using services like Edge, Hybrid Connectivity Services, and the basics of IP addresses and VPCs.

Week 8: Security 1

Goal:
Discover how AWS supports the creation of a robust security strategy through the Shared Responsibility Model, and learn about implementing a strong security foundation, applying security at all levels, and protecting data in transit.

Learning Objectives:

- Discuss how AWS supports the creation of a strong security strategy
- Explain how to implement a strong identity foundation using AWS
- Explain how to create traceability in AWS services and resources
- Explain how to secure data at the infrastructure layer
- Explain how to protect data in transit and at rest using AWS services
- Explain how to automate security best practices using AWS and provide management and auditing reports
- Explain how to minimize an AWS environments attack surface within an AWS environment
- Explain how to use AWS services to respond to security events

Module Outline:

1. **Security 1: Using AWS to Support a Strong Security Strategy**
    a. Introduction: Using AWS to Support a Strong Security Strategy
    b. Shared Responsibility Model
    c. IT Controls
    d. AWS Security Pillar
    e. Seven Security Design Principles
    f. Activity: AnyCompany Meal Delivery Introduction
    g. Knowledge Check
2. **Security 1: Implementing a Strong Identity Foundation**
    a. Introduction: Implementing a Strong Identity Foundation
    b. Revisiting Authentication and Authorization
    c. Federating Users in AWS
    d. AWS Identity and Access Management
    e. AWS IAM Identity Center for User Federation
    f. Mobile and Web Application Authentication with Amazon Cognito
    g. Additional AWS Services for Identity and Access Management
    h. IAM Policies
    i. Policy Evaluation Overview
    j. Lab: Intro to AWS Identity and Access Management (IAM)
    k. Activity: AnyCompany Meal Delivery Access Management
    l. Knowledge Check
3. **Security 1: Maintaining Traceability in AWS**
    a. Introduction: Maintaining Traceability in AWS
    b. Understanding Monitoring
    c. Monitoring Your network with CloudWatch
    d. Monitoring for Compliance and Best Practices with Security Hub
    e. Monitoring for Threads with GuardDuty
    f. Monitoring EC2 Instances with Amazon Inspector
    g. Monitoring for Sensitive Data with Macie
    h. Auditing and Reporting with CloudTrail
    i. Activity: AnyCompany Meal Delivery Monitoring
    j. Knowledge Check
4. **Security 1: Applying Security at All Layers**
    a. Introduction: Applying Security at All Layers
    b. Understanding the Layers
    c. Secure Services at the Infrastructure Layer
    d. Centralizing Security Management with AWS Firewall Manager
    e. Filtering Traffic with AWS WAF

   f. Protecting Against DDoS Attacks with AWS Shield
   g. Activity: AnyCompany Meal Delivery Securing All the Layers
   h. Knowledge Check
5. **Security 1: Automating Security Best Practices**
   a. Introduction: Automating Security Best Practices
   b. Automating Security Evaluations with AWS Trusted Advisor
   c. Automating Compliance with AWS Artifact and AWS Config
   d. Activity: AnyCompany Meal Delivery Automate Security Best Practices
   e. Knowledge Check
6. **Security 1: Protecting Data in Transit and at Rest**
   a. Introduction: Protecting Data in Transit and at Rest
   b. Encrypting Data with AWS
   c. Encrypting Data in Transit and Securing Messages with AWS Certificate Manager
   d. Encrypting Data at Rest with AWS KMS and AWS CloudHSM
   e. Activity: AnyCompany Meal Delivery Protecting Data
   f. Knowledge Check
7. **Security 1: Minimizing Your Attack Surface**
   a. Introduction: Minimizing Your Attack Surface
   b. Vulnerabilities That Can Increase Your Attack Surface
   c. Ways to Decrease the Attack Surface
   d. Activity: AnyCompany Meal Delivery Minimizing the Attack Surface
   e. Knowledge Check
8. **Security 1: Preparing for Security Events**
   a. Introduction: Preparing for Security Events
   b. Understanding Incident Response
   c. Incident Response in AWS
   d. Activity: AnyCompany Meal Delivery Security Events
   e. Knowledge Check

Activities:

- **Activity: AnyCompany Meal Delivery Introduction**
  - You must help your firm's customer, AnyCompany, with security for their customer service application in development.
- **Lab: Intro to AWS Identity and Access Management (IAM)**
  - In this lab, you will perform the following tasks: 1) Explore pre-created IAM users and groups, 2) Inspect IAM policies as applied to the pre-created groups, 3) Follow a real-world scenario, adding users to groups with specific capabilities enabled, 4) Locate and use the IAM sign-in URL, and 5) Experiment with the effects of policies on service access.
- **Activity: AnyCompany Meal Delivery Access Management**
  - Establish two levels of access to customer information based on a representative's tier within the company using an Active Directory.
- **Activity: AnyCompany Meal Delivery Monitoring**
  - Help your client audit API calls in the application to find root causes for issues, and collect metrics for its environment, while setting up alarms for any security issues.
- **Activity: AnyCompany Meal Delivery Securing All the Layers**
  - Help your client implement methods to protect against inter-based attacks, and mechanisms to properly patch physical and virtual hardware with fully up-to-date virus definitions and centralized security configuration capabilities.
- **Activity: AnyCompany Meal Delivery Automate Security Best Practices**
  - Help your client implement a service that will show a history of configuration changes.
- **Activity: AnyCompany Meal Delivery Protecting Data**
  - Help your client find a way to ensure that customer data is protected when customers are sending it through the application. They also need a way to encrypt their customer data in an Amazon RDS database.
- **Activity: AnyCompany Meal Delivery Minimizing the Attack Surface**
  - Help your client make their web and application servers more secure against online attacks.
- **Activity: AnyCompany Mean Delivery Security Events**

- Help your client identify the best service to help them analyze the events that their products generate and look for anomalies or security incidents.

Videos (Total Time 12:06):

- Shared Responsibility Model (2:10)
- Authentication and Authorization Recap (00:58)
- Granting Policies (1:55)
- AWS CloudTrail (2:30)
- Compliance (4:33)
- What is SSL/TLS? (3:28)

Ungraded Assessments (Formative):

These ungraded assessments establish the learner's pre-existing knowledge of the content, and are designed to review basic information about the fundamentals of network security including implementing a strong security foundation, applying security at all levels, and protecting data in transit.

Graded Assessment:

The graded assessment will cover information around network security including implementing a strong security foundation, applying security at all levels, and protecting data in transit.

Week 9: Storage 1

Goal:

We'll cover the different types of storage, including object storage, block storage, and file storage. You'll learn about Amazon S3, which provides highly scalable, secure, and cost-effective storage for objects and data, Amazon Elastic Block Store or Amazon EBS, which provides block-level storage for use with EC2 instances, and Amazon Elastic File System – or Amazon EFS, which allows you to build and maintain file systems in the cloud.

Learning Objectives:

- Describe different types of storage
- Discuss AWS cloud storage services
- Discuss how to use AWS storage services for data migration
- Discuss how to use hybrid cloud and edge storage
- Describe how to use the basic features of Amazon Simple Storage Service (Amazon S3) for object storage
- Describe how to use Amazon Elastic Block Store (EBS) for block storage
- Describe how to use Amazon Elastic File System (EFS) to build and maintain a file system in the cloud
- Discuss database storage options

Module Outline:

1. **Storage 1: Storage Basics**
    a. Introduction: Storage Basics
    b. Storage Fundamentals
    c. Knowledge Check
2. **Storage 1: AWS Cloud Storage Services**
    a. Introduction: AWS Cloud Storage Services
    b. AWS Cloud Storage
    c. Knowledge Check
3. **Storage 1: AWS Storage Services for Data Migration**
    a. Introduction: AWS Storage Services for Data Migration
    b. Migrating Data into the Cloud
    c. AWS Services for Data Migration
    d. DataSync Service Overview
    e. Snow Family Overview

   f. Transfer Family Overview
   g. Knowledge Check
4. **Storage 1: Hybrid Cloud and Edge Storage**
   a. Introduction: Hybrid Cloud and Edge Storage
   b. Migrating Data into the Cloud
   c. AWS Services for Data Migration
   d. DataSync Service Overview
   e. Snow Family Overview
   f. Transfer Family Overview
   g. Knowledge Check
5. **Storage 1: Working with Amazon S3**
   a. Introduction: Working with Amazon S3
   b. Working with Amazon S3
   c. Lab: Introduction to Amazon Simple Storage Service (S3)
   d. Amazon S3 Lifecycle Policies
   e. Amazon S3 Storage Classes
   f. Storage Classes for Frequently Accessed Data
   g. Storage Classes for Infrequently Accessed Date
   h. Storage Classes for Unknown or Changing Access Patterns
   i. Storage Classes for Archiving Objects
   j. Knowledge Check
6. **Storage 1: Amazon EBS**
   a. Introduction: Amazon EBS
   b. Amazon EBS Overview
   c. Amazon EBS Features and Benefits
   d. Amazon EBS Volume Types
   e. Choosing the Correct Amazon EBS Volume Type
   f. Amazon EBS Snapshots
   g. Amazon EBS Architecture
   h. Lab: Introduction to Amazon EBS
   i. Knowledge Check
7. **Storage 1: Amazon EFS**
   a. Introduction: Amazon EFS
   b. Amazon EFS Features and Benefits
   c. Amazon EFS Storage Classes
   d. Lab: Introduction to Amazon EFS
   e. Knowledge Check

Activities:

- **Lab: Introduction to Amazon Simple Storage Service (S3)**
  - In this lab, you will: 1) Create a bucket in Amazon Simple Storage Service (Amazon S3), 2) Upload objects to an Amazon S3 bucket, 3) Enable and use bucket versioning, and 4) Configure an object lifecycle management rule.
- **Lab: Introduction to Amazon EBS**
  - In this lab, you will: 1) Create Amazon EBS volumes, 2) Attach Amazon EBS volumes to Amazon Elastic Compute Cloud (Amazon EC2) instances, 3) Create snapshots, and 4) Restore EBS volumes from those snapshots.
- **Lab: Introduction to Amazon EFS**
  - In this lab, you will: 1) Create an Amazon Elastic File System (Amazon EFS) file system, 2) Log in to a Linux-based Amazon Elastic Compute Cloud (Amazon EC2) instance, 3) Mount your file system to your instance, and 4) Examine and monitor the performance of your file system.

Videos (Total Time 6:14):

- Storage Migration (3:48)
- Storage Gateway (2:26)

Ungraded Assessments (Formative):
These ungraded assessments establish the learner's pre-existing knowledge of the content, and are designed to review basic information about the fundamentals of storage in the Cloud and on AWS using S3, as well as Hybrid Cloud and Edge Storage, and Amazon EBS and EFS.

Graded Assessment:
The graded assessment will cover information around fundamentals of storage in the Cloud and on AWS using S3, as well as Hybrid Cloud and Edge Storage, and Amazon EBS and EFS.

Weeks 10 and Week 11: AWS CPE Preparation

Goal:
Assess and support preparedness for the AWS Certified Cloud Practitioner exam.

Learning Objectives:
- Review Cloud Concepts, Security and Compliance, Cloud Technology and Services, Pricing, Billing, and Support
- Review sample certification questions in each domain
- Practice skills with hands-on exercises
- Test knowledge with practice question sets
- Learn Testing strategies

Activities:
- Launch AWS SkillBuilder and review AWS Certified Cloud Practitioner Certification Preparation Course

Videos (Total Time 33:44):
- Storage Migration (3:48)
- Storage Gateway (2:26)

Ungraded Assessments (Formative):
These ungraded assessments establish the learner's pre-existing knowledge of the content, and are designed to review basic information about the fundamentals of storage in the Cloud and on AWS using S3, as well as Hybrid Cloud and Edge Storage, and Amazon EBS and EFS.

Graded Assessment:
The graded assessment will cover information around fundamentals of storage in the Cloud and on AWS using S3, as well as Hybrid Cloud and Edge Storage, and Amazon EBS and EFS.

Definitions

Text, Videos, Interactives:

- e-learning content
- Includes text, interactive e-learning experiences/e-learning interactions, animated videos, videos with trainers, repurposed existing e-learning content

Ungraded (Formative) Knowledge Checks

- Includes Pre- and Post-Module Assessment
- Multiple choice
- 2-5 questions

Graded (Summative) Assessments

- Multiple choice
- 20-30 questions

Ungraded Activity (case studies, games, simulations)

- Requires learner to perform, practice, or apply knowledge in a scenario or assess a scenario
- Requires learner to perform, practice, or apply knowledge
- Formative

Hands-on activity (AWS Jam challenges or labs)

- Formative or summative
- Graded or ungraded
- Learner uses a business scenario to perform operations in practice environment