Syllabus

CSC 153 Introduction to Cloud Computing

General Information

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Department Computing Sciences

Course Prefix CSC

Course Number 153

Course Title Introduction to Cloud Computing

Course Information

Catalog Description This course provides students an overall introduction to cloud computing concepts. The course includes Amazon Web Services (AWS) Academy Cloud Foundations, which is a course developed and maintained by Amazon. It provides a detailed overview of cloud concepts, AWS core services, security, architecture, pricing, and support. Additional course topics include scripting, Linux and command line programming, virtualization and distributed computing, version control, and data storage mechanisms. This course will prepare students to take the AWS Certified Cloud Practitioner certification exam.

Credit Hours 3

Lecture Contact Hours 3

Lab Contact Hours 0

Other Contact Hours 0

Grading Scheme Letter

Prerequisites

CSC 142 is recommended

Co-requisites

None

First Year Experience/Capstone Designation

This course DOES NOT satisfy the outcomes applicable for status as a FYE or Capstone.

SUNY General Education

This course is designated as satisfying a requirement in the following SUNY Gen Ed categories
None

FLCC Values

Institutional Learning Outcomes Addressed by the Course
Vitality, Inquiry, Perseverance, and Interconnectedness

Course Learning Outcomes

Course Learning Outcomes

1. Describe the functionality of various AWS services (e.g. VPC, EC2, RDS, S3, IAM) and their use cases.
2. Explain AWS cloud architectural principles.
3. Explain the AWS pricing philosophy and how to use AWS services to optimize costs in the Total Cost of Ownership.
4. Explore how computing skills can be applied in a cloud computing environment.

Outline of Topics Covered

Module 0: Course Introduction

- 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

- 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

- 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

Module 3: AWS Global Infrastructure Overview

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

Module 4: AWS Cloud Security

- 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

- 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

Module 6: Compute

- 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

- 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

- 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

- 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

- 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

Module 11: Additional Topics (Will be Selected From)

- Cloud computing environments ex. Google Cloud, MS Azure
- Programming skills in at least one scripting language
- Use of Linux, the command line and Application Programming Interfaces (APIs)
- Introduction to virtualization and distributed computing
- Introduction to version control (e.g., Git)
- Introduction to data storage mechanisms such as SQL

Program Affiliation

This course is not required as a core course in any programs.