



MERCER
COUNTY COMMUNITY COLLEGE

COURSE OUTLINE

Course Number	Course Title	Credits
NET 256	Cloud Foundations	3
Hours: Lecture/Lab/Other 2/2/0	Pre-requisite IST 101 or IST 102	Implementation Semester & Year FALL 2022

Catalog description:

Introduces students to cloud computing foundations, including a detailed overview of cloud concepts, AWS core services, security, architecture, pricing, and support. Designed for students majoring in Computer Information Systems or obtaining a Network Engineering Technology certificate.

General Education Category:
Not GenEd

Course coordinator:

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Required texts & Other materials:

- AWS Course Materials
- Free Open Source Software
- Learning Management System (LMS) – Blackboard

Required Faculty Training: Faculty must hold a certificate of completion from AWS Academy Graduate – AWS Academy Cloud Foundations to teach this course.

Course Student Learning Outcomes (SLO):

Upon successful completion of this course the student will be able to:

1. Define the AWS Cloud (**ILGs 11; PLOs 3, 5, 7**)
2. Explain the AWS pricing philosophy (**ILGs 2, 11; PLOs 2, 3, 4, 7**)
3. Identify the global infrastructure components of AWS (**ILGs 4, 11; PLOs 1, 2, 3**)
4. Describe the security and compliance measures of the AWS Cloud, including AWS Identity and Access Management (IAM) (**ILGs 4, 11; PLOs 1, 2, 3, 7**)
5. Create a virtual private cloud (VPC) by using Amazon Virtual Private Cloud (Amazon VPC) (**ILGs 4, 11; PLOs 1, 2, 6**)
6. Demonstrate when to use Amazon Elastic Compute Cloud (Amazon EC2), AWS Lambda, and AWS Elastic Beanstalk (**ILGs 4, 11; PLOs 1, 2, 6**)
7. Differentiate between Amazon Simple Storage Service (Amazon S3), Amazon Elastic Block Store (Amazon EBS), Amazon Elastic File System (Amazon EFS), and Amazon Simple Storage Service Glacier (Amazon S3 Glacier) (**ILGs 4, 11; PLOs 2, 3, 5, 7**)
8. Demonstrate when to use AWS database services, including Amazon Relational Database Service (Amazon RDS), Amazon DynamoDB, Amazon Redshift, and Amazon Aurora (**ILGs 4, 11; PLOs 1, 2, 6**)
9. Explain the architectural principles of the AWS Cloud (**ILGs 4, 11; PLOs 2, 3, 4, 7**)
10. Explore key concepts related to Elastic Load Balancing, Amazon CloudWatch, and Amazon EC2 (**ILGs 4, 11; PLOs 1, 2, 3, 8**)

Institutional Learning Goals (ILG):

Institutional Learning Goal 2 Mathematics: Students will use appropriate mathematical and statistical concepts and operations to interpret data and to solve problems.

Institutional Learning Goal 4 Technology: Students will use computer systems or other appropriate forms of technology to achieve educational and personal goals.

Institutional Learning Goal 11 Critical Thinking: Students will use critical thinking skills understand, analyze, or apply information or solve problems.

Program Learning Outcomes (PLO):

1. Understand, configure, and install hardware and software, including Internet user software;
2. Understand, describe, and apply network protocols and standards;
3. Explain computing practices and procedures found in most organizations;
4. Use printed and online technical documentation;
5. Describe how the Internet works;
6. Work effectively individually and in workgroups to install and implement information technology;
7. Demonstrate written and oral communication skills.
8. Pass industry certifications, including A+, NET+, Linux+, and Security+; Microsoft's MCTS, MCITP, MCSA, and MCSE; and Cisco's CCNA.

Units of study in detail – Unit Student Learning Outcomes:

Unit I [Unit I Cloud Concepts Overview] [Supports Course SLO #1]

Learning Objectives

The student will be able to:

- Introduce Cloud Computing
- Understand the advantages of the Cloud
- Introduce Amazon Web Services (AWS)
- Describe moving to the AWS Cloud

Unit II, III, & IV [Unit II: Cloud Economics and Billing; Unit III: AWS Global Infrastructure Overview; Unit IV: Cloud Security] [Supports SLOs #2, 3, 4]

Learning Objectives

The student will be able to:

- Understand the fundamentals of Pricing
- Understand Total Cost Ownership
- Distinguish AWS Organizations
- Calculate AWS Billing and Cost Management
- Identify Technical Support Models

Unit V [Unit V Networking and Content Delivery] [Supports Course SLOs #4, 5]

Learning Objectives

The student will be able to:

- Identify and understand Networking Basics
- Identify and understand Amazon VPC
- Identify and understand VPC Networking
- Identify and understand VPC Security
- Identify and understand Route 53
- Identify and understand CloudFront

Unit VI [Unit VI Compute] [Supports Course SLOs #2, 6]

Learning Objectives

The student will be able to:

- Compute Services Overview
- Describe Amazon EC2
- Determine Amazon EC2 Cost Optimization
- Understand Container Services
- Introduce AWS Lambda
- Introduce AWS Elastic Beanstalk

Unit VII [Unit VII Storage] [Supports Course SLOs #7]

Learning Objectives

The student will be able to:

- Understand and Identify AWS EBS
- Understand and Identify AWS S3
- Understand and Identify AWS EFS
- Understand and Identify AWS S3 Glacier

Unit VIII [Unit VIII Databases] [Supports Course SLOs #8]

Learning Objectives

The student will be able to:

- Understand and Identify Amazon RDS
- Understand and Identify Amazon DynamoDB
- Understand and Identify Amazon Redshift
- Understand and Identify Amazon Aurora

Unit IX [Unit IX Cloud Architecture] [Supports Course SLOs #2, 9]

Learning Objectives

The student will be able to:

- Describe AWS Well-Architected Framework Design Principles
- Identify Operational Excellence
- Understand and describe Security
- Understand and describe Reliability
- Understand and describe Performance Efficiency
- Calculate Cost Optimization
- Differentiate Reliability & High Availability

Unit X [Unit X Automatic Scaling and Monitoring] [Supports Course SLOs #10]

Learning Objectives

The student will be able to:

- Describe Elastic Load Balancing
- Understand and Identify Amazon CloudWatch
- Understand and Identify Amazon EC2 Auto Scaling

Evaluation of student learning: [Evaluates SLOs #1 – 10]

Students' achievement of the course objectives will be evaluated through the use of the following:

- Labs and Homework assessing students' problem solving ability.
- Quizzes and Exams assessing students' comprehension of the AWS environments and concepts.
- An individual project to assess the students' ability to solve relatively complex problems.

Specific methods for evaluating student progress through the course are up to the discretion of the instructor. Below is an example of grade breakdown:

Grade Criteria:

Item	Percent
Laboratory & Homework Assignments	35%
Final Project Presentations	20%
Quizzes	15%
Midterm Exam	15%
Final Exam	15%
Total	100%

Grading Schematics:

Letter grade	Nominal %	QPA quality points
A	93-100	4.0
A-	90-92	3.7
B+	87-89	3.4
B	83-86	3.0
B-	80-82	2.7
C+	77-79	2.4
C	70-76	2.0
D	60-69	1.0
F	0-59	0.0
S	70-100	NA
NC	0-69	NA