

**CS 181.11 Course Outline as of Fall 2024****CATALOG INFORMATION**

Dept and Nbr: CS 181.11 Title: INTRO TO CLOUD COMPUTE

Full Title: Introduction to Virtualization and Cloud Computing

Last Reviewed: 2/22/2021

Units	Course Hours per Week		Nbr of Weeks		Course Hours Total	
Maximum	3.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	3.00	Lab Scheduled	0	8	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable

Grading: Grade or P/NP

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

**Catalog Description:**

This course provides the underlying knowledge required by IT Professionals who will be evaluating cloud computing solutions (such as Google Cloud, Microsoft Azure, and Amazon Web Services), whether they are administrators, developers, or database administrators. It introduces students to the principles of cloud computing and students will become familiar with how these principles have been implemented in the major commercial platforms. In addition, this course explains how to implement the core infrastructure, consisting of virtual networks and storage. With this foundation, students will be able to create the most common services, including virtual machines, web apps, and databases. The students will also learn about container-based services and the most prominent examples of serverless computing. The course also serves the needs of individuals seeking to pass the Computing Technology Industry Association's (CompTIA) Cloud+ and Cloud Essentials certification exams.

**Prerequisites/Corequisites:****Recommended Preparation:**

Completion of CS 81.81A and CS 82.22A and CS 82.58

**Limits on Enrollment:**

### **Schedule of Classes Information:**

Description: This course provides the underlying knowledge required by IT Professionals who will be evaluating cloud computing solutions (such as Google Cloud, Microsoft Azure, and Amazon Web Services), whether they are administrators, developers, or database administrators. It introduces students to the principles of cloud computing and students will become familiar with how these principles have been implemented in the major commercial platforms. In addition, this course explains how to implement the core infrastructure, consisting of virtual networks and storage. With this foundation, students will be able to create the most common services, including virtual machines, web apps, and databases. The students will also learn about container-based services and the most prominent examples of serverless computing. The course also serves the needs of individuals seeking to pass the Computing Technology Industry Association's (CompTIA) Cloud+ and Cloud Essentials certification exams. (Grade or P/NP)

Prerequisites/Corequisites:

Recommended: Completion of CS 81.81A and CS 82.22A and CS 82.58

Limits on Enrollment:

Transfer Credit:

Repeatability: Two Repeats if Grade was D, F, NC, or NP

### **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

<b>AS Degree:</b>	<b>Area</b>	<b>Effective:</b>	<b>Inactive:</b>
<b>CSU GE:</b>	<b>Transfer Area</b>	<b>Effective:</b>	<b>Inactive:</b>
<b>IGETC:</b>	<b>Transfer Area</b>	<b>Effective:</b>	<b>Inactive:</b>
<b>CSU Transfer:</b>		<b>Effective:</b>	<b>Inactive:</b>
<b>UC Transfer:</b>		<b>Effective:</b>	<b>Inactive:</b>

**CID:**

**Certificate/Major Applicable:**

Not Certificate/Major Applicable

### **COURSE CONTENT**

#### **Student Learning Outcomes:**

At the conclusion of this course, the student should be able to:

1. Design a cloud deployment strategy
2. Identify the costs and benefits involved with migrating to the cloud

#### **Objectives:**

At the conclusion of this course, the student should be able to:

1. Explain the importance and benefits of cloud computing and the need for its rapid adoption
2. Explain roadmap for building cloud infrastructure using the cloud computing reference model
3. Evaluate existing infrastructure and identify components for a cloud transformation
4. Describe and identify various cloud interface standards and protocols for building cloud infrastructure

5. Describe service management activities in cloud computing
6. Build a risk-based assessment program of cloud providers' controls
7. Understand the key areas to focus on in cloud contracts
8. Evaluate the various layers of cloud infrastructure
9. Adapt a disaster recovery and business continuity plan for cloud environments
10. Perform vulnerability assessments in a cloud environment
11. Integrate encryption and identity management services in a cloud environment
12. Improve incident response and monitoring capabilities in the cloud

### **Topics and Scope:**

1. Prepare to deploy cloud solutions
2. Deploy and test a pilot project
3. Design a secure network for cloud deployment
4. Determine CPU, memory sizing, and storage requirements for cloud deployments
5. Plan identity and access management for cloud deployments
6. Analyze workload characteristics to ensure successful migration to the cloud
7. Secure systems to meet access requirements
8. Maintain cloud systems
9. Implement backup, restore, and business continuity measures
10. Analyze cloud systems for required performance, anomalies, and growth forecasting
11. Troubleshoot deployment, capacity, automation, and orchestration issues
12. Troubleshoot connectivity and security issues
13. Understand the fundamental concepts, business aspects, and impact of cloud computing
14. Differentiate the types of cloud solutions and the adoption measures needed
15. Identify the technical challenges and the mitigation measures involved in cloud computing
16. Identify the steps to successfully adopt cloud services
17. Identify the possible risks involved in cloud computing and the risk mitigation measures, as well as identify the potential cost considerations for the implementation of cloud and its strategic benefits

### **Assignment:**

Reading assignments include:

1. Online research of cloud deployment and security practices
2. Approximately 50 pages weekly from the textbook

Homework problems include:

1. Weekly online discussion thread participation
2. Hands-on exercises to demonstrate proficiency with each topic
3. Online quizzes
4. Assignments for deploying cloud solutions for various requirements

Other assignments include:

1. Quizzes (9 -11) and skill demonstration exams
2. Classroom scenario-based exercises

### **Methods of Evaluation/Basis of Grade:**

**Writing:** Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Weekly written online discussions

Writing  
5 - 10%

**Problem Solving:** Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework problems and assignments for deploying cloud solutions for various requirements

Problem solving  
15 - 30%

**Skill Demonstrations:** All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Class performances

Skill Demonstrations  
20 - 30%

**Exams:** All forms of formal testing, other than skill performance exams.

Quizzes and skill demonstration exams

Exams  
20 - 30%

**Other:** Includes any assessment tools that do not logically fit into the above categories.

Attendance and participation in scenario-based exercises

Other Category  
5 - 20%

### **Representative Textbooks and Materials:**

Cloud Infrastructure and Services: Virtualization and Cloud Infrastructure Technology Concepts and Principles. EMC Education Services. Wiley. 2020

CompTIA Cloud+ Certification Study Guide: Exam CV0-002. 2nd ed. Wilson, Scott. McGraw-Hill Education. 2018

CompTIA Cloud Essentials+ Study Guide: Exam CLO-002. 2nd ed. Doctor, Quentin and Fuchs, Cory. Sybex. 2020