

# CNSE M107: AWS CLOUD SYSTEM OPERATIONS

**Originator**

egarcia

**Co-Contributor(s)**
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**College**

Moorpark College

**Attach Support Documentation (as needed)**

Job\_Posting\_Analytics\_6\_Occupations\_in\_3\_California\_Counties\_202007.pdf

SCCRC\_Regional\_Comparison\_5\_Occupations\_in\_3\_Regions\_202007.pdf

Orange Coast College CIS A281.pdf

SMC CS 79C.pdf

**Discipline (CB01A)**

CNSE - Computer Netwrk Sys. Engr. Prg

**Course Number (CB01B)**

M107

**Course Title (CB02)**

AWS Cloud System Operations

**Banner/Short Title**

AWS Cloud System Operations

**Credit Type**

Credit

**Honors**

No

**Start Term**

Fall 2021

**Catalog Course Description**

Provides training for students who seek an overall understanding of how to provision cloud technologies, design cloud architectures, implement performance and security controls, and manage the overall tuning of cloud technologies. Covers cloud system operations such as high availability, deployment, storage, data management, networking, automation and optimization using Amazon Web Services. Aligns with Amazon Web Services System Operations Certification Exam.

**Additional Catalog Notes**

This course helps prepare students to pass the Amazon Web Services (AWS) SysOps Exam from Amazon Web Services.

**Taxonomy of Programs (TOP) Code (CB03)**

0708.00 - \*Computer Infrastructure and Support

**Course Credit Status (CB04)**

D (Credit - Degree Applicable)

**Course Transfer Status (CB05) (select one only)**

B (Transferable to CSU only)

**Course Basic Skills Status (CB08)**

N - The Course is Not a Basic Skills Course

**SAM Priority Code (CB09)**

C - Clearly Occupational

**Course Cooperative Work Experience Education Status (CB10)**

N - Is Not Part of a Cooperative Work Experience Education Program

**Course Classification Status (CB11)**

Y - Credit Course

**Educational Assistance Class Instruction (Approved Special Class) (CB13)**

N - The Course is Not an Approved Special Class

**Course Prior to Transfer Level (CB21)**

Y - Not Applicable

**Course Noncredit Category (CB22)**

Y - Credit Course

**Funding Agency Category (CB23)**

Y - Not Applicable (Funding Not Used)

**Course Program Status (CB24)**

1 - Program Applicable

**General Education Status (CB25)**

Y - Not Applicable

**Support Course Status (CB26)**

N - Course is not a support course

**Field trips**

Will not be required

**Grading method**

Letter Graded

**Alternate grading methods**

Credit by exam, license, etc.

**Does this course require an instructional materials fee?**

No

**Repeatable for Credit**

No

**Is this course part of a family?**

No

**Units and Hours**

**Carnegie Unit Override**

No

**In-Class**

**Lecture**

**Minimum Contact/In-Class Lecture Hours**

35

**Maximum Contact/In-Class Lecture Hours**

35

**Activity**

**Laboratory**

**Minimum Contact/In-Class Laboratory Hours**

52.5

**Maximum Contact/In-Class Laboratory Hours**

52.5

**Total in-Class**

**Total in-Class**

**Total Minimum Contact/In-Class Hours**

87.5

**Total Maximum Contact/In-Class Hours**

87.5

**Outside-of-Class**

**Internship/Cooperative Work Experience**

**Paid**

**Unpaid**

**Total Outside-of-Class**

**Total Outside-of-Class**

**Minimum Outside-of-Class Hours**

70

**Maximum Outside-of-Class Hours**

70

**Total Student Learning**

**Total Student Learning**

**Total Minimum Student Learning Hours**

157.5

**Total Maximum Student Learning Hours**

157.5

**Minimum Units (CB07)**

3

**Maximum Units (CB06)**

3

**Student Learning Outcomes (CSLOs)**

**Upon satisfactory completion of the course, students will be able to:**

- |   |   |
|---|---|
| 1 | explain how access keys are used when accessing cloud services.           |
| 2 | explain the use of Identity Access Management and user roles.             |
| 3 | explain system administration tasks pertaining to various cloud services. |

**Course Objectives**

**Upon satisfactory completion of the course, students will be able to:**

- |    |  |
|----|--|
| 1  | describe how to create and use an access key set.                                |
| 2  | describe how to create user access and user roles.                               |
| 3  | administer the deployment of elastic compute services.                           |
| 4  | explain the advantages and disadvantages of elastic block storage.               |
| 5  | explain the use of elastic internet protocol (EIP) addresses.                    |
| 6  | design a virtual private cloud.  |
| 7  | explain the use of a route 53 health checks, autoscaling, and load balancing.    |
| 8  | explain the deployment options for network address translation in the cloud.     |
| 9  | describe the deployment of simple storage solutions (S3) in the cloud.           |
| 10 | contrast the various databases available in the cloud.                           |
| 11 | explain the role of cloud monitoring services such as cloudwatch and cloudtrail. |

**Course Content****Lecture/Course Content**

- **5% - Accessing Cloud Services and Identity Management**
  - Root and Users Accounts
  - Command Line Interface
  - Storing Credentials
  - AWS Security, Identity, and Access Management
- **15% - EC2 Computing**
  - Choosing Amazon Machine Images
  - Launching Instances
  - Designing your Environment
  - System Design for High Availability
- **20% - Networking in the Cloud**
  - Designing a Virtual Private Cloud
  - Configuring Route Tables
  - Configuring Network Address Translation
  - Security Groups
  - Network Access Lists
  - Elastic Addresses
- **20% - Storage Types in the Cloud**
  - Simple Storage Solutions
  - Elastic Block Storage
  - Elastic File System
  - Amazon Glacier
  - Amazon Gateways
- **20% - Managing Databases in the Cloud**
  - Structured Query Language Databases
  - No Structured Query Language Databases
  - Scaling Databases
  - DynamoDB
  - Redshift
- **10% - Application Integration and High Availability in the Cloud**

- Simple Queue Services
- Simple Notification System
- Disaster Recovery
- **10% - Monitoring Services in the Cloud**
  - CloudWatch
  - CloudTrail
  - Trusted Advisor
  - Billing
  - Cost and Usage Reports

### Laboratory or Activity Content

- 6% - AWS Systems Manager
- 6% - Create Website on S3
- 6% - Creating Elastic Computing Instances
- 6% - Troubleshooting Instances
- 6% - Using AutoScaling
- 6% - Route 53 Failover Routing
- 6% - working with AWS Lambda
- 6% - Migrate to Amazon Relations Databases
- 6% - Configure Virtual Private Cloud
- 6% - Troubleshoot Virtual Private Cloud
- 6% - Managing Storage
- 6% - Working with S3
- 6% - Working with CloudTrail
- 6% - Optimize Utilization
- 8% - Automation with CloudFormation
- 8% - Troubleshooting CloudFormation

### Methods of Evaluation

**Which of these methods will students use to demonstrate proficiency in the subject matter of this course? (Check all that apply):**

Problem solving exercises  
Skills demonstrations

**Methods of Evaluation may include, but are not limited to, the following typical classroom assessment techniques/required assignments (check as many as are deemed appropriate):**

Computational homework  
Group projects  
Individual projects  
Laboratory activities  
Laboratory reports  
Oral analysis/critiques  
Objective exams  
Oral presentations  
Other (specify)  
Problem-solving exams  
Quizzes  
Reports/papers  
Skills demonstrations  
Skill tests or practical examinations  
Simulations

#### Other

Passing Cloud relevant certification

### Instructional Methodology

**Specify the methods of instruction that may be employed in this course**

Audio-visual presentations  
Computer-aided presentations  
Collaborative group work

Class activities  
 Case studies  
 Distance Education  
 Group discussions  
 Guest speakers  
 Instructor-guided interpretation and analysis  
 Instructor-guided use of technology  
 Internet research  
 Laboratory activities  
 Lecture  
 Small group activities

**Describe specific examples of the methods the instructor will use:**

Instructor will integrate a learning management system, e.g., Canvas, for supplemental support such as providing lab supplemental materials and whitepapers. Curriculum may be provided via Amazon Web Services Academy and AWS Educate for viewing of pre-recorded lectures, labs, demonstrations, and knowledge assessments.

Lab: Instructor will provide augmented instructions on lab exercises along with screen prints explaining detailed steps. Labs will include instructor's comments and observations for students to note while completing labs. Students will be expected to complete labs multiple times and be able to explain why specific configuration options are being deployed. Students are also expected to troubleshoot and verify working cloud configurations. Students will submit labs that are automatically scored online and submit completion scores as evidence of completion using a learning management system (LMS), for example, Canvas or Blackboard. Labs utilize a credit system which provides a sandboxed cloud configuration environment of equipment, resources, and services at no cost to the student and is subsidized through AWS Academy. This arrangement will allow for repetitive practice of lab work without incurring costs.

## Representative Course Assignments

### Writing Assignments

1. Write about solutions and best practices for Cloud System Operations.
2. Write technical explanations of configuration in support of architecture configuration improvements.
3. Develop written explanation of specific cloud administration practice that improve services along with quantifying its benefits.

### Critical Thinking Assignments

1. Provide a performance solution that improves a cloud operations.
2. Provide a operations solution that improves a cloud configuration.
3. Provide a security strategy that improves an existing cloud configuration security posture.
4. Explain the process to migrate an existing in-house configuration to the cloud and explain the benefits of the new cloud architecture.
5. Review and discuss certification type exam questions and provide explanations that support solutions.

### Reading Assignments

1. Review and explain the benefits of various Amazon web services.
2. Review in depth a specific cloud service from a competitor to Amazon.
3. Review an AWS whitepaper and provide a short explanation of the benefit of this architecture or service, best practice, or recommendation.
4. Review prominent AWS whitepapers such as Security Best Practices.

### Skills Demonstrations

1. Given a list of cloud requirements, complete a semi-complex lab architecture without having detailed step-by-step instructions.
2. Given an on-premise topology, recommend a cloud migration pathway.
3. Given a cloud configuration diagram, configure the necessary components and services that meet the technical requirements.
4. Given a cloud configuration, explain the benefits and best practices of that specific deployment in the cloud.

## Outside Assignments

### Representative Outside Assignments

1. Research topics related to new cloud solutions and offer additional improvements related to performance, scalability, security, availability, cost optimization or other pertinent improvements.
2. Research new cloud tools and how they provide modern solutions in system and network protection.
3. Migrate an existing in-house configuration to the cloud and design a cloud operation solution that monitors and improves a cloud architecture.

- 4. Research and explain cloud case studies.
- 5. Provide an analysis of specific cloud whitepapers.

**Articulation**

**Equivalent Courses at other CCCs**

<b>College</b>	<b>Course ID</b>	<b>Course Title</b>	<b>Units</b>
Santa Monica College	CS 79C	Compute Engines in the Cloud	3
Orange Coast College	CIS/IT A281	Cloud Infrastructure and Services	3

**District General Education**

**A. Natural Sciences**

**B. Social and Behavioral Sciences**

**C. Humanities**

**D. Language and Rationality**

**E. Health and Physical Education/Kinesiology**

**F. Ethnic Studies/Gender Studies**

**Course is CSU transferable**

Yes

**CSU Baccalaureate List effective term:**

Fall 2021

## CSU GE-Breadth

**Area A: English Language Communication and Critical Thinking**

**Area B: Scientific Inquiry and Quantitative Reasoning**

**Area C: Arts and Humanities**

**Area D: Social Sciences**

**Area E: Lifelong Learning and Self-Development**

**Area F: Ethnic Studies**

**CSU Graduation Requirement in U.S. History, Constitution and American Ideals:**

**IGETC**

**Area 1: English Communication**

**Area 2A: Mathematical Concepts & Quantitative Reasoning**

**Area 3: Arts and Humanities**

**Area 4: Social and Behavioral Sciences**

**Area 5: Physical and Biological Sciences**

**Area 6: Languages Other than English (LOTE)**

## Textbooks and Lab Manuals

### Resource Type

Textbook

### Classic Textbook

Yes

### Description

Alapati, Sam. *AWS [Amazon Web Services] Certified SysOps Administrator Associate; All-in-One – Exam Guide*. McGraw-Hill, 2019.

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### Resource Type

Websites

### Description

<https://AWS.Training.com> - Moorpark Colleges CNSE program is an approved Amazon Web Services Academy and can provide access to professional curriculum of videos, lectures, quizzes and online lab exercises. Access is only to approved Academies that have completed faculty training and certification criteria

AWS Educate provides additional supplemental resources

Amazon Web Services provides various lab exercises for Amazon Lab environments

Udemy provides sample Certification Exam Banks

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### Resource Type

Textbook

### Classic Textbook

Yes



**Description**

Sequeira, Anthony J. AWS [Amazon Web Services] *Certified SysOps Administrator Associate (SOA-C01) Certification Guide*. Pearson IT Certification, 2019.

**Library Resources**

**Assignments requiring library resources**

Research, using the Library’s print and online resources.

**Sufficient Library Resources exist**

Yes

**Example of Assignments Requiring Library Resources**

Research for a paper on topics such as modern security tools, modern threats and vulnerabilities, and data analysis.

**Distance Education Addendum**

**Definitions**

**Distance Education Modalities**

- Hybrid (51%–99% online)
- Hybrid (1%–50% online)
- 100% online

**Faculty Certifications**

Faculty assigned to teach Hybrid or Fully Online sections of this course will receive training in how to satisfy the Federal and state regulations governing regular effective/substantive contact for distance education. The training will include common elements in the district-supported learning management system (LMS), online teaching methods, regular effective/substantive contact, and best practices.

Yes

Faculty assigned to teach Hybrid or Fully Online sections of this course will meet with the EAC Alternate Media Specialist to ensure that the course content meets the required Federal and state accessibility standards for access by students with disabilities. Common areas for discussion include accessibility of PDF files, images, captioning of videos, Power Point presentations, math and scientific notation, and ensuring the use of style mark-up in Word documents.

Yes

**Regular Effective/Substantive Contact**

**Hybrid (1%–50% online) Modality:**

Method of Instruction	Document typical activities or assignments for each method of instruction
Other DE (e.g., recorded lectures)	Same as 100% online but done in front of a classroom with supportive explanation.

**Hybrid (51%–99% online) Modality:**

Method of Instruction	Document typical activities or assignments for each method of instruction
Other DE (e.g., recorded lectures)	Same as 100% online but done in front of a classroom with supportive explanation.

**100% online Modality:**

Method of Instruction	Document typical activities or assignments for each method of instruction
Other DE (e.g., recorded lectures)	100% online but additional supplemental materials provided including on campus availability and Zoom conferences as optional student support.

## Examinations

### Hybrid (1%–50% online) Modality

Online  
On campus

### Hybrid (51%–99% online) Modality

Online  
On campus

### Primary Minimum Qualification

COMPUTER INFORMATION SYS

### Additional local certifications required

7+ years of Info Technology experience and a relevant Amazon Web Services Cloud Certification.

## Review and Approval Dates

### Department Chair

10/19/2020

### Dean

10/26/2020

### Technical Review

11/5/2020

### Curriculum Committee

11/15/2020

### DTRW-I

12/10/2020

### Curriculum Committee

MM/DD/YYYY

### Board

MM/DD/YYYY

### CCCCO

MM/DD/YYYY

### Control Number

CCC000616422

### DOE/accreditation approval date

MM/DD/YYYY