CNSE M105: CLOUD FOUNDATIONS

Originator
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Co-Contributor(s)

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College
Moorpark College

Attach Support Documentation (as needed)
Gartner Forecasts Worldwide Public Cloud Revenue to Grow 17.pdf
Linked_IN_The Skills Companies Need Most in 2019 – And How to Learn Them.pdf
Global_Knowledge_10 Most Important IT Skills for 2019.pdf
BLS_Computer Network Architects _ Occupational Outlook Handbook _ USA.pdf
Regional Advisory Meeting-Agenda_May 17_19.docx
CNSE M105_state approval letter_CCC000608532.pdf

Discipline (CB01A)
CNSE - Computer Netwrk Sys. Engr. Prg

Course Number (CB01B)
M105

Course Title (CB02)
Cloud Foundations

Banner/Short Title
Cloud Foundations

Credit Type
Credit

Honors
No

Start Term
Spring 2020

Catalog Course Description
Provides training for students who seek an overall understanding of cloud computing concepts and experience configuring cloud components. Includes a detailed overview of cloud concepts, Amazon Web Services (AWS) core services, security, architecture, pricing, and support.

Additional Catalog Notes
This course helps prepare students to pass the AWS Cloud Foundations Exam from Amazon.com.

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
(L) Letter Graded

Alternate grading methods
(E) 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 various cloud services that are available on cloud platforms.
2	explain the various advantages cloud computing provides including computing, storage, performance, availability, and security.

Course Objectives

	Upon satisfactory completion of the course, students will be able to:
1	explain the Global Infrastructure that supports Cloud Computing.
2	differentiate between Elastic Compute Cloud (EC2) instances.
3	explain Elastic Load Balancer.
4	explain the application and benefits of Amazon Web Services (AWS) Lambda.
5	explain Storage Services including Elastic Block Store, Simple Storage Service, Elastic File System, Glacier and their implementation in the cloud.
6	compare the various databases such as Relational Database Systems, DynamoDB, Redshift, Aurora, and the appropriate Database selection. based on need.
7	explain the various cloud security services including Shared Responsibility Model, Identity and Access Management, Compliance Programs, Trusted Advisor, and security best practices.
8	explain the Well-Architected framework and the Well-Architected Design Principles that provide Reliability and High Availability.
9	explain the various pricing options including pricing details, cost optimization, and an overview of Technical Support Plans and Costs including Total Cost of Ownership.
10	compare the implementation of Network Address Translation Instances versus Gateways.
11	contrast the implementation of Security Groups and Access Control Lists.

Course Content

Lecture/Course Content

- **5% - Cloud Concepts**
  - What is Cloud Computing?
  - AWS Global Infrastructure Overview
- **50% - AWS Core Services**
  - Core Service Introduction
  - Introduction to Compute Services
  - Compute Service Overview
  - Amazon Elastic Compute Cloud (EC2)
  - Elastic Load Balancer (ELB)
  - AWS Lambda
  - AWS Elastic Beanstalk
  - Introduction to Storage Services
  - Elastic Block Store (EBS)
  - Amazon Simple Storage Service (S3)
  - Amazon Elastic File System (EFS)
  - Amazon Glacier
  - Introduction to Database Services
  - Amazon Relational Database Systems (RDS)
  - Amazon DynamoDB
  - Amazon Redshift
  - Amazon Aurora
- **20% - AWS Security**
  - AWS Shared Responsibility Model
  - AWS Access Identity and Access Management (IAM)
  - AWS Security and Compliance Programs
  - AWS Trusted Advisor

- AWS Security Resources
- AWS Day One Best Practices

- **15% - AWS Architecting**
  - Introduction to the Well-Architected Framework
  - Well-Architected Design Principles
  - Understanding Reliability and High Availability
- **10% - Cloud Billing and Support Services**
  - Fundamentals of Pricing
  - Pricing Details
  - Cost Optimization
  - Overview of AWS Technical Support Plans and Costs
  - Total Cost of Ownership (TCO)

Laboratory or Activity Content

- **5% - Introduction to Amazon EC2**
- **15% - Working with Elastic Block Storage**
- **20% - Build Your Virtual Private Cloud and Launch a Web Server**
- **15% - Build a Database Server**
- **15% - Scale and Load Balance Your Architecture**
- **15% - Introduction to AWS Identity and Access Management**
- **5% - Explore in the Sandbox**
- **5% - Complete a New Amazon Free Lab**
- **5% - Complete a Second New Amazon Free Lab**

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
Problem-solving exams
Quizzes
Reports/papers
Skills demonstrations
Skill tests or practical examinations
Simulations

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:

Lecture: Instructor will integrate a learning management system, e.g., Canvas, for supplemental support such as lab supplemental materials and Whitepapers. Curriculum is provided via Amazon Web Services Academy for viewing of pre-recorded lectures, demonstrations, and knowledge assessments.

Lab: Instructor will provide 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 configurations 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 additional costs.

Representative Course Assignments

Writing Assignments

1. Write about solutions and best practices that cloud computing provides.
2. Provide explanation of services in support of topology configuration improvements.
3. Develop written explanation of specific cloud service along with its benefits.

Critical Thinking Assignments

1. Provide a performance solution that improves a cloud configuration.
2. Provide a reliability, scalability, or availability solution that improves a cloud configuration.
3. Provide a security strategy that improves an existing cloud configurations security posture
4. Migrate an existing in-house configuration to the cloud and explain the benefits of the new cloud architecture.
5. Review and discuss 3rd party exam questions and provide explanation to solutions.

Reading Assignments

1. Review and explain the benefits of a new Amazon Web Service.
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 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 configuration without having detailed step-by-step instructions.
2. Given a pre-configured lab topology and explain topology and what services are in use.

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 explain the benefits of the new cloud architecture.

Articulation

Equivalent Courses at other CCCs

College	Course ID	Course Title	Units
Santa Monica College	CS 79A	Introduction to Cloud Computing	3
Orange Coast College	CIS A281	Cloud Infrastructure and Services	3
Sacramento City College	CISN 327	Cloud Infrastructure and Services	3.5

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:
Spring 2020

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
No

Description
Piper, B., and Clinton, D. (2019). *AWS certified cloud practitioner, study guide*. Sybex.

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 training and certification criteria

AWS Educate provides additional supplemental resources

Quiklabs provides various lab exercises for Amazon Lab environments

Udemy provides sample Certification Exam Banks

Resource Type
Textbook

Description
Sequeira, A. (2019). *AWS certified cloud practitioner (CFL-C01)*. Pearson, IT Certification.

Library Resources

Assignments requiring library resources
Research, using the Library's print and online resources, on topics such as modern security tools, modern threats and vulnerabilities, and data analysis.

Sufficient Library Resources exist
Yes

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 Amazon Web Services Cloud Foundations Certification.

Review and Approval Dates

Department Chair
08/27/2019

Dean
08/27/2019

Technical Review
08/29/2019

Curriculum Committee
09/03/2019

DTRW-I
09/12/2019

Curriculum Committee
MM/DD/YYYY

Board
10/08/2019

CCCCO
10/12/2019

Control Number
CCC000608532

DOE/accreditation approval date
MM/DD/YYYY