## I. CATALOG INFORMATION

A. Discipline: COMPUTER NETWORKING SYSTEMS ENGINEERING (CNSE)

B. Subject Code and Number: CNSE M170

C. Course Title: Cloud Security

D. Credit Course units:

Units: 3

Lecture Hours per week: 2

Lab Hours per week : 3

Variable Units : No

E. Student Learning Hours:

Lecture Hours:

Classroom hours: 35 - 35

Laboratory/Activity Hours:

Laboratory/Activity Hours 52.5 - 52.5

**Total Combined Hours** in a 17.5 week term: 87.5 - 87.5

F. Non-Credit Course hours per week _____

G. May be taken a total of: [X] 1 [ ] 2 [ ] 3 [ ] 4 time(s) for credit

H. Is the course co-designated (same as) another course: No [X] Yes [ ]
If YES, designate course Subject Code & Number: _____

I. Course Description:

Provides an overview of the architectural concepts and design requirements including cloud security, platform and application security, cloud operations and legal compliance. Emphasizes cloud security principles and practices.

J. Entrance Skills

*Prerequisite: No [X] Yes [ ] Course(s)

_____

*Corequisite: No [X] Yes [ ] Course(s)

_____

Limitation on Enrollment: No [X] Yes [ ]

_____

Recommended Preparation: No [ ] Yes [X] Course(s)
CNSE M01 or CNSE M67 or CNSE M82

Other: No [X] Yes [ ]

_____

K. Other Catalog Information:

Prepares student for Certified Cloud Security Professional exam.

## II. COURSE OBJECTIVES

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

| | | **Methods of evaluation will be consistent with, but not limited by, the following types or examples.** |
|---|---|---|
| 1 | describe cloud architecture concepts and design requirements for cloud operations. | Quizzes Classroom project work demonstrating competency in this area Midterms Final exam |
| 2 | design cloud data security principles. | Quizzes Classroom project work demonstrating competency in this area Midterms Final exam |
| 3 | design platform and infrastructure security. | Quizzes Classroom project work demonstrating competency in this area Midterms Final exam |
| 4 | implement cloud application security. | Quizzes Classroom project work demonstrating competency in this area Midterms Final exam |
| 5 | design physical and logical cloud operations. | Quizzes Classroom project work demonstrating competency in this area Midterms Final exam |
| 6 | describe legal and ethical compliance to cloud environments. | Quizzes Classroom project work demonstrating competency in this area Midterms Final exam |

## III. COURSE CONTENT

| **Estimated %** | **Topic** | **Learning Outcomes** |
|---|---|---|
| **Lecture** (must total 100%) | | |
| 7.00% | Cloud reference architecture | 1, 2, 6 |
| 7.00% | Design principles of secure cloud computing and trusted cloud services | 2 |

| | | |
|---|---|---|
| 7.00% | Cloud data lifecycle and cloud data storage architectures | 1, 2 |
| 7.00% | Data security strategies, data discovery and classification technologies, and data rights management | 2, 6 |
| 5.00% | Implement relevant jurisdictional data protections for personally identifiable information (PIN) | 1, 2, 5, 6 |
| 7.00% | Data retention, deletion, and archiving policies and auditability, and accountability of events | 1, 2, 6 |
| 7.00% | Infrastructure components, risk, security controls, and disaster recovery and business continuity management | 1, 4, 5 |
| 7.00% | Security awareness, software assurance, use verified secure software, software development life-cycle (SDLC) process, and identity and access management (IAM) solutions | 4, 6 |
| 7.00% | Data center design, and physical and logical infrastructure for cloud environment | 1, 3, 5, 6 |
| 7.00% | Data center design, and physical and logical infrastructure for cloud environment | 1, 3, 6 |
| 7.00% | Compliance with regulations and controls, risk assessment to infrastructure | 1, 6 |
| 7.00% | Collection, acquisition, and preservation of digital evidence, and communication with relevant parties | 1, 2, 6 |
| 7.00% | Legal requirements and risks within the cloud environment, privacy issues, jurisdictional variation | 1, 6 |
| 7.00% | Audit process, methodologies, and required adaptions for a cloud environment | 1, 2, 6 |
| 4.00% | Outsourcing and cloud contract design and vendor management | 1, 4, 5, 6 |
| **Lab** (must total 100%) | | |
| 20.00% | A. Create a virtual machine (VM) in the cloud utilizing different vendor solutions<br>1. Amazon Web Services (AWS)<br>2. Google App Engine<br>3. Microsoft Windows Azure | 1, 2, 3 |
| 20.00% | B. Storage in the cloud utilizing different vendor solutions<br>1. Google Drive<br>2. Microsoft SkyDrive<br>3. Amazon Cloud Drive<br>4. Dropbox<br>5. Apple iCloud | 1, 2, 3, 5 |
| 20.00% | C. Scaling up and scaling down virtual machines (VM's) utilizing different vendor solutions<br>1. Amazon AWS<br>2. Google App Engine<br>3. Microsoft Windows Azure | 2, 3, 5 |
| 20.00% | D. Networking in the cloud<br>1. Client side networking<br>2. Network management<br>3. IP addressing<br>4. Switching and routing in virtual environments<br>5. Performance tuning<br>6. Internet service provider (ISP) service level agreements | 1, 2, 5 |
| | E. Securing resources in the cloud | |

| | | |
|---|---|---|
| 20.00% | 1. Security policy creation and implementation<br>2. Password complexity<br>3. Encryption<br>4. Data integrity<br>5. Antivirus and firewalls designed for virtualized solutions | 3, 4, 5, 6 |

## IV. TYPICAL ASSIGNMENTS

A. Writing assignments

| Writing assignments are required. Possible assignments may include, but are not limited to: | |
|---|---|
| 1 | short answer class assignments such as describing features of a specific private cloud design. |
| 2 | short answer class assignments with specific network solutions to various cloud configuration scenarios. |
| 3 | short answer class assignments describing various new technology solutions available only on the cloud. |

B. Appropriate outside assignments

| Appropriate outside assignments are required. Possible assignments may include, but are not limited to: | |
|---|---|
| 1 | assigned readings that explain the various configuration options in setting up a cloud environment and explain the benefits of those configurations. |
| 2 | assignments related to cloud configuration challenges to support specific business application needs. |
| 3 | exercises and problems on replicating an internal data center service in the cloud environment. |

C. Critical thinking assignments

| Critical thinking assignments are required. Possible assignments may include, but are not limited to: | |
|---|---|
| 1 | design a cloud solution that replicates a large information technology infrastructure in the cloud and meets business requirements. |
| 2 | compare and contrast various security configurations to support access to cloud-based applications. |
| 3 | review best practices in troubleshooting and auditing cloud environments. |

## V. METHODS OF INSTRUCTION

Methods of instruction may include, but are not limited to:

[X] Distance Education – When any portion of class contact hours is replaced by distance education delivery mode (Complete DE Addendum, Section XV)

[X] Lecture/Discussion

[X] Laboratory/Activity

[X] Other (Specify) Lecture notes
Study guides
PowerPoint presentations
Sample "check for understanding" quizzes

Other instructor-approved online content

☐ Optional Field Trips

☐ Required Field Trips

## VI. METHODS OF EVALUATION

**Methods of evaluation may include, but are not limited to:**

| | | |
|---|---|---|
| ☐ Essay Exam | ☒ Classroom Discussion | ☒ Skill Demonstration |
| ☒ Problem Solving Exam | ☒ Reports/Papers/ Journals | ☒ Participation |
| ☒ Objective Exams | ☒ Projects | ☒ Other (specify) |

Quizzes

Classroom project work demonstrating competency in this area

Midterms and final exam

## VII. REPRESENTATIVE TEXTS AND OTHER COURSE MATERIALS

O'Hara, Brian T., and Ben Malislow. CCSP Certified Cloud Security Professional Official Study Guide. Sybex, 2017.

Carter, Daniel. CCSP Certified Cloud Security Professional All-in-One Exam Guide. McGraw-Hill, 2017.

## VIII. STUDENT MATERIALS FEES

☒ No ☐ Yes

## IX. PARALLEL COURSES

| *College* | *Course Number* | *Course Title* | *Units* |
|---|---|---|---|
| Montgomery County Community College | CIS 166 | Introduction to Cloud Computing | 3 |
| Oxnard College | CNIT R151 | Cloud Computing and Services | 4 |
| Tidewater Community College | ITN 257 | Cloud Computing:Infrastructure and Services | 4 |

## X. MINIMUM QUALIFICATIONS

**Courses Requiring a Masters Degree:**
Any bachelor's degree and two years of related technical experience, or any associate degree and six years of related technical experience.

## XI. ARTICULATION INFORMATION

A. Title V Course Classification:

1. This course is designed to be taken either:

☐ Pass/No Pass only (no letter grade possible); or

☐

[X] Letter grade (P/NP possible at student option)

2. Degree status:
   Either [X] Associate Degree Applicable; or [ ] Non-associate Degree Applicable

B. Moorpark College General Education:

1. Do you recommend this course for inclusion on the Associate Degree General Education list?
   Yes: [ ] No: [X] If YES, what section(s)?

   [ ] A1 - Natural Sciences - Biological Science
   [ ] A2 - Natural Sciences - Physical Science
   [ ] B1 - Social and Behavioral Sciences - American History/Institutions
   [ ] B2 - Social and Behavioral Sciences - Other Social Behavioral Science
   [ ] C1 - Humanities - Fine or Performing Arts
   [ ] C2 - Humanities - Other Humanities
   [ ] D1 - Language and Rationality - English Composition
   [ ] D2 - Language and Rationality - Communication and Analytical Thinking
   [ ] E1 - Health/Physical Education
   [ ] E2 - PE or Dance
   [ ] F - Ethnic/Gender Studies

C. California State University(CSU) Articulation:

1. Do you recommend this course for transfer credit to CSU? Yes: [ ] No: [X]

2. If YES do you recommend this course for inclusion on the CSU General Education list?
   Yes: [ ] No: [X] If YES, which area(s)?

   A1 [ ] A2 [ ] A3 [ ] B1 [ ] B2 [ ] B3 [ ] B4 [ ]

   C1 [ ] C2 [ ] D1 [ ] D2 [ ] D3 [ ] D4 [ ] D5 [ ]

   D6 [ ] D7 [ ] D8 [ ] D9 [ ] D10 [ ] E [ ]

D. University of California (UC) Articulation:

1. Do you recommend this course for transfer to the UC? Yes: [ ] No: [X]

2. If YES do you recommend this course for the Intersegmental General Education Transfer Curriculum (IGETC)? Yes: [ ] No: [X]

   IGETC Area 1: English Communication

   [ ] English Composition
   [ ] Critical Thinking-English Composition
   [ ] Oral Communication

IGETC Area 2: Mathematical Concepts and Quantitative Reasoning

- [ ] Mathematical Concepts

IGETC Area 3: Arts and Humanities

- [ ] Arts
- [ ] Humanities

IGETC Area 4: Social and Behavioral Sciences

- [ ] Anthropology and Archaeology
- [ ] Economics
- [ ] Ethnic Studies
- [ ] Gender Studies
- [ ] Geography
- [ ] History
- [ ] Interdisciplinary, Social & Behavioral Sciences
- [ ] Political Science, Government & Legal Institutions
- [ ] Psychology
- [ ] Sociology & Criminology

IGETC Area 5: Physical and Biological Sciences (mark all that apply)

- [ ] Physical Science Lab or Physical Science Lab only (none-sequence)
- [ ] Physical Science Lecture only (non-sequence)
- [ ] Biological Science
- [ ] Physical Science Courses
- [ ] Physical Science Lab or Biological Science Lab Only (non-sequence)
- [ ] Biological Science Courses
- [ ] Biological Science Lab course
- [ ] First Science course in a Special sequence
- [ ] Second Science course in a Special Sequence
- [ ] Laboratory Activity
- [ ] Physical Sciences

IGETC Area 6: Language other than English

- [ ] Languages other than English (UC Requirement Only)
- [ ] U.S. History, Constitution, and American Ideals (CSU Requirement ONLY)
- [ ] U.S. History, Constitution, and American Ideals (CSU Requirement ONLY)

## XII. REVIEW OF LIBRARY RESOURCES

A. What planned assignment(s) will require library resources and use?

The following assignments require library resources:
Possible research using the Library's print and online resources on case studies implementing cloud solutions.

B. Are the currently held library resources sufficient to support the course assignment?

YES: [X] NO: [ ]

If NO, please list additional library resources needed to support this course.

## XIII. PREREQUISITE AND/OR COREQUISITE JUSTIFICATION

CNSE M170: Not Applicable

## XIV. WORKPLACE PREPARATION

Required for career technical courses only. A career technical course/program is one with the primary goal to prepare students for employment immediately upon course/program completion, and/or upgrading employment skills.

Detail how the course meets the Secretary of Labors Commission on the Achievement of Necessary Skills (SCANS) areas. (For a description of the competencies and skills with a listing of what students should be able to do, go to: http://www.ncrel.org/sdrs/areas/issues/methods/assment/as7scans.htm)

The course will address the SCANS competency areas:

1. Resources: the students will identify, organize, plan and allocate resources through course work and application of theory to practice.
2. Interpersonal: the students will work together as a team to build, evaluate projects, and solve technical problem scenarios.
3. Information: the students will acquire and use information through a variety of assignments, network technology tools, and computer software used in computer network systems.
4. Systems: the students will employ a variety of computer tools to complete projects or assess computer networking problems.
5. Technology: the students will use modern technology to acquire the skills needed to prepare for a career and will use various software tools to support instruction such as a network simulator.

The course also addresses the SCANS skills and personal qualities:

1. Basic Skills: the students will read, perform computer mathematic operations, listen and speak for weekly assignments and participate in classroom discussions.
2. Thinking Skills: the students will think creatively and make decisions in order to solve computer network problems and demonstrate reasonable problem solving skills.
3. Personal Qualities: the students will be required to display responsibility, self-management, integrity, and honesty throughout course work and classroom exercises.

## XV. DISTANCE LEARNING COURSE OUTLINE ADDENDUM

1. Mode of Delivery

   [X] Online (course will be delivered 100% online)

   [X] Online with onsite examinations (100% of the instruction will occur online, but examinations and an orientation will be scheduled onsite)

   [X] Online/Hybrid (a percentage of instruction will be held online and the remaining percentage of instruction will be held onsite)
   - [ ] Lab activities will be conducted onsite

   [ ] Televideo (Examinations and an orientation will be held onsite)

   [ ] Teleconference

   [X] Other Use of Netlabs

2. Need/Justification

   Improve general student access.

3. Describe how instructors teaching this course will ensure regular, effective contact with and among students.

   The instructor will be available online and will monitor the Distance Learning online course. The instructor will use the available tools in the course management system (CMS) for two-way student/instructor communication. Instructor will use the CMS tools in order to provide assessments such as assignments and quizzes.

4. Describe how instructors teaching this course will involve students in active learning.

   Discussion boards. Other tools, online and PC resident, and forums will be used so that students can practice their skills as it applies to the course material. Through the course management system (CMS), materials will be made available online for download. Assessments for measuring understanding and student performance feedback will be made available through the CMS tools. Assignments, labs, and discussions will be available online.

5. Explain how instructors teaching this course will provide multiple methods of content representation.

   All topics are available for research online and align with CompTia Network+ curriculum. Videos and online discussion boards.

6. Describe how instructors teaching this course will evaluate student performance.

   Quizzes, Homework, Labs, and Exams.

## XVI. GENERAL EDUCATION COURSE OUTLINE ADDENDUM

CNSE M170: Not Applicable

## XVII. STUDENT MATERIALS FEE ADDENDUM

CNSE M170: Not Applicable

## XVIII. REPEATABILITY JUSTIFICATION TITLE 5, SECTION 55041

CNSE M170: Not Applicable

## XIX. CURRICULUM APPROVAL

Course Information:

Discipline:
COMPUTER NETWORKING SYSTEMS ENGINEERING (CNSE)

Discipline Code and Number: CNSE M170

Course Revision Category: New Course

Course Proposed By:

Originating Faculty Edmond Garcia 01/10/2018

Faculty Peer: Edmond Garcia 01/10/2018

Curriculum Rep: _____

Department Chair: Navreet Sumal 01/10/2018

Division Dean: Howard Davis 01/10/2018

Approved By:

Curriculum Chair: Jerry Mansfield 12/07/2018

Executive Vice President: _____

Articulation Officer: Jodi Dickey 02/28/2018

Librarian: Mary LaBarge 02/27/2018

Implementation Term and Year: Fall 2019

Approval Dates:

Approved by Moorpark College Curriculum Committee: 11/20/2018

Approved by Board of Trustees (if applicable): 02/19/2019

Approved by State (if applicable): 02/25/2019