I. CATALOG INFORMATION

A. Discipline: COMPUTER NETWORKING SYSTEMS ENGINEERING (CNSE)

B. Subject Code and Number: CNSE M86

C. Course Title: Firewall Administration

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:

Covers knowledge and skills needed to install, configure, verify, and manage firewalls. Provides instruction on how to secure internal networks from public Internet users.

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 M18

Other: No [X] Yes [ ]

_____

K. Other Catalog Information:

Prepares students for firewall certification 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	define firewall and categorize network security threats.	Quizzes, Classroom project work demonstrating competency in this area, Midterms, Final exams
2	identify three types of firewalls.	Quizzes, Classroom project work demonstrating competency in this area, Midterms, Final exams
3	explain or demonstrate how to install or update a new operating system or firmware on firewall.	Quizzes, Classroom project work demonstrating competency in this area, Midterms, Final exams
4	deploy basic firewall configurations.	Quizzes, Classroom project work demonstrating competency in this area, Midterms, Final exams
5	compare the differences between firewall static address translation and dynamic address translation.	Quizzes, Classroom project work demonstrating competency in this area, Midterms, Final exams
6	describe static command and conduit command.	Quizzes, Classroom project work demonstrating competency in this area, Midterms, Final exams
7	use syslog and determine the logging level on the firewall.	Quizzes, Classroom project work demonstrating competency in this area, Midterms, Final exams
8	set up the authentication, authorization, and accounting on a firewall.	Quizzes, Classroom project work demonstrating competency in this area, Midterms, Final exams

9	explain or demonstrate how to use firewall protocol configuration commands.	Quizzes, Classroom project work demonstrating competency in this area, Midterms, Final exams
10	organize and configure the firewall for failover to a secondary firewall.	Quizzes, Classroom project work demonstrating competency in this area, Midterms, Final exams
11	set up a firewall for Secure Sockets Layer (SSL), Virtual Private Networking (VPN), or Internet Protocol Security (IPSec) support.	Quizzes, Classroom project work demonstrating competency in this area, Midterms, Final exams
12	demonstrate an understanding of how to configure access controls.	Quizzes, Classroom project work demonstrating competency in this area, Midterms, Final exams
13	demonstrate how to configure authentication, authorization, accounting (AAA) server.	Quizzes, Classroom project work demonstrating competency in this area, Midterms, Final exams

III. COURSE CONTENT

Estimated %	Topic	Learning Outcomes
Lecture (must total 100%)		
4.00%	Introduction to Network Security	1
8.00%	Firewall Software and Hardware	2
8.00%	Working with and Upgrading the Firewall Software Image or Firmware	3
8.00%	Configuring the Firewall via Graphical Interface or Command Line	4
8.00%	Firewall Address Translation	5
8.00%	Configuring Access through the Firewall	6
8.00%	Configuring Syslog Tracking of Network Activty	7
8.00%	AAA Configuration on the Firewall	8
8.00%	Firewall Advanced Protocol Handling and Attack Guards	9
8.00%	Firewall Failover	10
8.00%	Configuring Internet Protocol Security on the Firewall	11
8.00%	Configure Firewall Access Controls	12

8.00%	Internetwork Operating System (IOS) Firewall Authentication Proxy Configuration	13

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 or comparisons between Cisco Pix, Sonic Wall and Palo Alto firewalls.
2	written exercises and problems on firewall design.
3	short answer class assignments with specific network solutions to various firewall configuration scenarios.

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 of firewall equipment and explain the benefits of those configurations.
2	exercises and problems on the network and firewall redesign.
3	assignments on researching solutions to various business needs that can be solved via firewall configurations. Example: Restricting Facebook.com access to only lunch break hours.

C. Critical thinking assignments

Critical thinking assignments are required. Possible assignments may include, but are not limited to:	
1	design a firewall configuration based on the number of hosts to be translated based on access requirements.
2	compare and contrast various security configurations.
3	design solutions to providing a secure firewalled network including guest wireless users, Demilitarized Zone users (DMZ), and Public Internet access.

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) Online materials
Assigned Internet research
Computer simulations

[ ] 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)

Case study analysis/assessment

VII. REPRESENTATIVE TEXTS AND OTHER COURSE MATERIALS

Santos, Omar, Panos Kampanakis, and Aaron Woland. Cisco Next-Generation Security Solutions: All-in-One Cisco ASA Firepower Services, NGIPS, and AMP (Networking Technology: Security). ciscopress.com, 2016.

Rajib, Nazmul. Cisco Firepower Threat Defense: Configuration and Troubleshooting Best Practices for the Next-Generation. Cisco, 2017.

copyright protected access to Sonic Wall and Palo Alto documentation once student accounts are created thru Netlabs.

VIII. STUDENT MATERIALS FEES

☒ No ☐ Yes

IX. PARALLEL COURSES

College	*Course Number*	*Course Title*	*Units*
Santa Barbara City College	CNEE 146	Firewalls and VPNs	4
Coastline Community College	CST C253	Cisco ASA, PIX, and Network Security Advisory: CCNA	3
College of the Canyons	CMPNET 271	Preparation for SND & SNRS	3.5

X. MINIMUM QUALIFICATIONS

Courses in Disciplines in which Masters Degrees are not expected:
any bachelor's degree and two years of professional experience, or any associate degree and two years networking experience + preferred CCNA or Security certification

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
   ☒ Letter grade (P/NP possible at student option)

2. Degree status:
   Either ☒ 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: ☒ 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: ☐

2. If YES do you recommend this course for inclusion on the CSU General Education list?
   Yes: ☐ No: ☒ 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: ☒

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

   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 such topics as the use of firewall configurations to limit employee's use of social media during work hours.

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 M86: 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. Students 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 (Online Lab system)

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 Cisco, Sonic Wall and Palo Alto curriculum. Videos and online discussion boards are readily available.

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

   Quizzes, Homework, Labs, and Exams.

XVI. GENERAL EDUCATION COURSE OUTLINE ADDENDUM

CNSE M86: Not Applicable

XVII. STUDENT MATERIALS FEE ADDENDUM

CNSE M86: Not Applicable

XVIII. REPEATABILITY JUSTIFICATION TITLE 5, SECTION 55041

CNSE M86: Not Applicable

XIX. CURRICULUM APPROVAL

Course Information:

Discipline:
COMPUTER NETWORKING SYSTEMS ENGINEERING (CNSE)

Discipline Code and Number: CNSE M86

Course Revision Category: Technical Course Revision

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 03/07/2018

Executive Vice President: _____

Articulation Officer: Jodi Dickey 02/27/2018

Librarian: Mary LaBarge 02/27/2018

Implementation Term and Year: Fall 2018

Approval Dates:

Approved by Moorpark College Curriculum Committee: 03/06/2018

Approved by Board of Trustees (if applicable): 06/12/2018

Approved by State (if applicable): 06/21/2018