

**CS 82.22C Course Outline as of Fall 2024****CATALOG INFORMATION**

Dept and Nbr: CS 82.22C      Title: ENT NET SEC  
 Full Title: Enterprise Networking, Security, and Automation  
 Last Reviewed: 2/22/2021

Units	Course Hours per Week		Nbr of Weeks		Course Hours Total	
Maximum	4.00	Lecture Scheduled	4.00	17.5	Lecture Scheduled	70.00
Minimum	4.00	Lab Scheduled	0	8	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	4.00		Contact Total	70.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 140.00

Total Student Learning Hours: 210.00

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 third and final course in the Cisco Certified Network Associate (CCNA) series describes the architecture, components, operations, and security to scale for large, complex networks, including Wide Area Network (WAN) technologies. The course emphasizes network security concepts and introduces network virtualization and automation. Students learn how to configure, troubleshoot, and secure enterprise network devices and understand how Application Programming Interfaces (API) and configuration management tools enable network automation.

**Prerequisites/Corequisites:**

Course Completion of CS 82.2B ( or CS 82.22B)

**Recommended Preparation:****Limits on Enrollment:****Schedule of Classes Information:**

Description: This third and final course in the Cisco Certified Network Associate (CCNA) series describes the architecture, components, operations, and security to scale for large, complex networks, including Wide Area Network (WAN) technologies. The course emphasizes network

security concepts and introduces network virtualization and automation. Students learn how to configure, troubleshoot, and secure enterprise network devices and understand how Application Programming Interfaces (API) and configuration management tools enable network automation. (Grade or P/NP)

Prerequisites/Corequisites: Course Completion of CS 82.2B ( or CS 82.22B)

Recommended:

Limits on Enrollment:

Transfer Credit: CSU;

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

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

**AS Degree:**      **Area**      Effective:      Inactive:

**CSU GE:**      **Transfer Area**      Effective:      Inactive:

**IGETC:**      **Transfer Area**      Effective:      Inactive:

**CSU Transfer:** Transferable      Effective:      Fall 2021      Inactive:

**UC Transfer:**      Effective:      Inactive:

**CID:**

**Certificate/Major Applicable:**

Both Certificate and Major Applicable

## **COURSE CONTENT**

**Student Learning Outcomes:**

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

1. Configure, troubleshoot, and secure enterprise network devices
2. Differentiate application programming interfaces (APIs) and the configuration management tools that make network automation possible.

**Objectives:**

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

1. Configure single-area Open Shortest Path First (OSPFv2) in both point-to-point and multiaccess networks.
2. Explain how to mitigate threats and enhance network security using access control lists and security best practices.
3. Implement standard IPv4 Access Control Lists (ACLs) to filter traffic and secure administrative access.
4. Configure Network Address Translation (NAT) services on the edge router to provide IPv4 address scalability.
5. Explain techniques to provide address scalability and secure remote access (such as Virtual Private Network (VPN) and Internet Protocol Security (IPSec)) for Wide Area Networks (WANs).
6. Explain how to optimize, monitor, and troubleshoot scalable network architectures.
7. Explain how networking devices implement Quality of Service (QoS).
8. Implement protocols to manage the network.

9. Explain how technologies such as virtualization, software defined networking, and automation affect evolving networks.

### Topics and Scope:

- I. Single-Area OSPFv2 Concepts
- II. Single-Area OSPFv2 Configuration
- III. Network Security Concepts
- IV. ACL Concepts and Configuration
- V. NAT for IPv4
- VI. WAN Concepts
- VII. Virtual Private Network (VPN) and Internet Protocol Security (IPSec) Concepts
- VIII. QoS Concepts
- IX. Network Management
- X. Network Design
- XI. Network Troubleshooting
- XII. Network Virtualization
- XIII. Network Automation

### Assignment:

Reading assignments include:

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

Homework problems include:

- 1. Weekly online discussion thread participation
- 2. Hands-on exercises and class performances to demonstrate proficiency with topics
- 3. Online quizzes
- 4. Creation of security design diagrams and layouts

Other assignments include:

- 1. Quizzes (9 - 11) and skill demonstration exam
- 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, Creation of network, operating system and security design diagrams and layouts

Problem solving  
15 - 30%

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

Skill demonstration exam

Skill Demonstrations  
20 - 30%

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

Quizzes and skill demonstration exam

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:**

Enterprise Networking, Security, and Automation Companion Guide (CCNAv7). Cisco Networking Academy. Cisco Press. 2020

Enterprise Networking, Security, and Automation Course Booklet (CCNAv7). Cisco Networking Academy. Cisco Press. 2020