

CATALOG INFORMATION

Dept and Nbr: CS 82.2B            Title: SW RT W ESSENT  
Full Title: Switching, Routing and Wireless Essentials  
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:        CS 82.22B

**Catalog Description:**  
The second course in the Cisco Certified Network Associate (CCNA) curriculum focuses on switching technologies and router operations that support small-to-medium business networks and includes Wireless Local Area Networks (WLANs) and security concepts. Students learn key switching and routing concepts. Students will perform basic network configuration and troubleshooting, identify and mitigate Local Area Network (LAN) security threats, and configure and secure a basic WLAN.

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

**Recommended Preparation:**

**Limits on Enrollment:**

**Schedule of Classes Information:**  
Description: The second course in the Cisco Certified Network Associate (CCNA) curriculum focuses on switching technologies and router operations that support small-to-medium business networks and includes Wireless Local Area Networks (WLANs) and security concepts. Students

learn key switching and routing concepts. Students will perform basic network configuration and troubleshooting, identify and mitigate Local Area Network (LAN) security threats, and configure and secure a basic WLAN. (Grade or P/NP)

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

Recommended:

Limits on Enrollment:

Transfer Credit: CSU;

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

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

|                   |                      |                   |                  |
|-------------------|----------------------|-------------------|------------------|
| <b>AS Degree:</b> | <b>Area</b>          | <b>Effective:</b> | <b>Inactive:</b> |
| <b>CSU GE:</b>    | <b>Transfer Area</b> | <b>Effective:</b> | <b>Inactive:</b> |

|               |                      |                   |                  |
|---------------|----------------------|-------------------|------------------|
| <b>IGETC:</b> | <b>Transfer Area</b> | <b>Effective:</b> | <b>Inactive:</b> |
|---------------|----------------------|-------------------|------------------|

|                      |              |                   |           |                  |
|----------------------|--------------|-------------------|-----------|------------------|
| <b>CSU Transfer:</b> | Transferable | <b>Effective:</b> | Fall 2021 | <b>Inactive:</b> |
|----------------------|--------------|-------------------|-----------|------------------|

|                     |  |                   |  |                  |
|---------------------|--|-------------------|--|------------------|
| <b>UC Transfer:</b> |  | <b>Effective:</b> |  | <b>Inactive:</b> |
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**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. Analyze the processes routers and switches employ to enable communication through Virtual Local Area Networks.
2. Perform, with an increasing degree of proficiency, basic switch configurations, demonstrating increasing comprehension of switching metrics and protocols.
3. Design and implement a classless Internet Protocol (IP) addressing scheme, applying the skills and knowledge obtained in this class.

### **Objectives:**

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

1. Configure Virtual Local Area Networks (VLANs) and Inter-VLAN routing applying security best practices.
2. Troubleshoot inter-VLAN routing on Layer 3 devices.
3. Configure redundancy on a switched network using Spanning Tree Protocol (STP) and EtherChannel.
4. Troubleshoot EtherChannel on switched networks.
5. Explain how to support available and reliable networks using dynamic addressing and first-hop redundancy protocols.
6. Configure dynamic address allocation in IPv4 and IPv6 networks.
7. Configure Wireless Local Area Networks (WLANs) using a Wireless Lan Controller and Layer 2 security best practices.
8. Configure switch security to mitigate LAN attacks.

9. Configure IPv4 and IPv6 static routing on routers.

### Topics and Scope:

1. Basic Switch and End Device Configuration
2. Protocols and Models
3. Numbering Systems
4. Data Link Layer
5. Ethernet Switching including STP and EtherChannel
6. Network Layer
7. Address Resolution
8. Basic Router Configuration (such as VLAN)
9. IPv4 and IPv6 Addressing
10. Internet Control Messaging Protocol (ICMP)
11. Transport and Application Layers
12. Network Security Fundamentals
13. Build a Small Network

### 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 configurations

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 |
|-----------------------------------|

|                    |
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| Writing<br>5 - 10% |
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**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 |
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|                             |
|-----------------------------|
| Problem solving<br>15 - 30% |
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**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, 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:**

Switching, Routing, and Wireless Essentials Companion Guide (CCNAv7). Cisco Networking Academy. Cisco Press. 2020

Switching, Routing, and Wireless Essentials Course Booklet (CCNAv7). Cisco Networking Academy. Cisco Press. 2020