



**CSCI 42 - Cisco III**

**Catalog Description**

**Transfer Status:** CSU  
**Prerequisite:** CSCI 41  
**Unit(s):** 3.00  
**Lecture:** 34.00 Contact hours/68.00 Out of class hours/102.00 Total hours/2.00 Unit(s)  
**Lab:** 51.00 Contact hours/0.00 Out of class hours/51.00 Total hours/1.00 Unit(s)  
**Total:** 85.00 Contact hours/68.00 Out of class hours/153.00 Total hours/3.00 Unit(s)

**Course Description:** The third course in the globally recognized Cisco Certified Networking Associate (CCNA) curriculum describes the architectures and considerations related to designing, securing, operating, and troubleshooting enterprise networks. This course covers wide area network (WAN) technologies and quality of service (QoS) mechanisms used for secure remote access along with the introduction of software-defined networking, virtualization, and automation concepts that support the digitalization of networks. Students gain skills to configure and troubleshoot enterprise networks, and learn to identify and protect against cybersecurity threats. They are introduced to network management tools and learn key concepts of software-defined networking, including controller-based architectures and how application programming interfaces (APIs) enable network automation. (C-ID ITIS 152).

**Objectives**

- Upon successful completion of this course, the student should be able to:
1. Configure single-area OSPFv2 in both point-to-point and multi-access networks.
  2. Explain how to mitigate threats and enhance network security using access control lists and security best practices.
  3. Implement standard IPv4 ACLs to filter traffic and secure administrative access.
  4. Configure NAT services on the edge router to provide IPv4 address scalability.
  5. Explain techniques to provide address scalability and secure remote access for WANs.
  6. Explain how to optimize, monitor, and troubleshoot scalable network architectures.
  7. Explain how networking devices implement QoS.
  8. Implement protocols to manage the network.
  9. Explain how technologies such as virtualization, software-defined networking, and automation affect evolving networks.

**Course Content**

| Topic Titles / Suggested Time Topic |                |                |
|-------------------------------------|----------------|----------------|
|                                     | <u>Lecture</u> |                |
| <u>Topics</u>                       |                | <u>Lec Hrs</u> |
| Single-Area OSPFv2 Concepts         |                | 1.50           |
| Single-Area OSPFv2 Configuration    |                | 2.00           |
| Network Security Concepts           |                | 3.00           |
| ACL Concepts                        |                | 2.00           |
| ACLs for IPv4 Configuration         |                | 3.50           |
| NAT for IPv4                        |                | 1.50           |
| WAN Concepts                        |                | 3.00           |
| VPN and IPsec Concepts              |                | 2.00           |
| QoS Concepts                        |                | 2.00           |
| Network Management                  |                | 3.50           |
| Network Design                      |                | 2.00           |
| Network Troubleshooting             |                | 2.50           |
| Network Virtualization              |                | 2.50           |
| Network Automation                  |                | 3.00           |
| Total Hours:                        |                | 34.00          |
|                                     | <u>Lab</u>     |                |
| <u>Topics</u>                       |                | <u>Lab Hrs</u> |
| Single-Area OSPFv2 Concepts         |                | 2.50           |
| Single-Area OSPFv2 Configuration    |                | 3.00           |
| Network Security Concepts           |                | 4.00           |

| <b>Topics</b>               | <b>Lab Hrs</b> |
|-----------------------------|----------------|
| ACL Concepts                | 3.50           |
| ACLs for IPv4 Configuration | 5.00           |
| NAT for IPv4                | 2.50           |
| WAN Concepts                | 4.00           |
| VPN and IPsec Concepts      | 3.50           |
| QoS Concepts                | 3.00           |
| Network Management          | 4.50           |
| Network Design              | 3.50           |
| Network Troubleshooting     | 3.00           |
| Network Virtualization      | 3.00           |
| Network Automation          | 6.00           |
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| <b>Total Hours:</b>         | <b>51.00</b>   |

### Methods of Instruction

- A. Demonstrations
- B. Discussion
- C. Homework: Students are required to complete two hours of outside-of-class homework for each hour of lecture
- D. Lecture
- E. Reading Assignments

### Methods of Evaluation

- A. Exams/Tests
- B. Homework
- C. Lab Projects
- D. Written Examinations
- E. Practical Evaluations

### Examples of Assignments

#### Reading Assignments

1. Read the link on the future of Software Defined Networks (SDN) and cloud infrastructure. Be prepared to discuss the options in class.
2. Read the paper on REST API, be prepared to discuss in class how it enables computer to computer communications.

#### Writing Assignments

1. Research available WAN connectivity and services for a medium sized business. Write a 1-2 page paper comparing and contrasting services and costs.
2. Compare and contrast JSON, YAML and XML data formats. Write a 1-2 page paper explaining the intricacies and application of each.

#### Out-of-Class Assignments

1. Using Packet Tracer, troubleshoot, repair, and document the network provided.
2. Research open-source Syslog Servers, and select the best one for a medium sized company, be prepared to justify your choice in class.

### Recommended Materials of Instruction

#### Other Learning Materials

Required online access to Cisco Networking Academy

#### Minimum Qualifications

Computer Information Systems  
Computer Science (Masters Required)  
Computer Service Technology

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