

Course Information Form (CIF)

Course Code: CSC 115

Course Title: Networking I - Routers and Switches

Department: Business/Computer Science and Technologies

Effective Date: Summer 2026

PCS Code: 1.2 - Occupational/Technical Instruction

CIP Code: 11.0901

Repeatability: 0

Credit Hours

Catalog Notation: 2-2-3

Credit Hour Distribution:

Lecture: 2

Lab: 2

Clinical: 0

Total: 3

General Course Information

Catalog Description

Configuration of Cisco IOS devices such as router and switches. Students will gain valuable hands on experience configuring static and dynamic routing, L2 and L3 switching, Virtual LANs, Network Address Translation, VLAN Trunking protocol, and the Dynamic Host Configuration Protocol.

General Course Objectives

Intensive coverage of LANs and Routing associated skills as the first of two courses in the Cisco Networking curriculum.

Minimum Placement Levels

English

None

Reading

None

Math

None

Prerequisites

Credit in CSC 130

Methods of Evaluation

2 objective exams, 4-6 quizzes, and 16 lab projects.

Instructional Materials and Additional Supplies

[CCNA Routing and Switching 200-125 Official Cert Guide Library, 9781587205811](#)

Course Content

General Learning Outcomes (GLOs)

- Critical Thinking and Information Literacy: Students will demonstrate the ability to evaluate perspectives, evidence, and implications, and to locate, assess, and use information effectively.
- Technology: Students will demonstrate the ability to evaluate, select, and appropriately use current and emerging tools.

Course Segments and Student Learning Outcomes

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
The Operation of Data Networks	<ol style="list-style-type: none"> 1. Describe the purpose and functions of various network devices. 2. Select the components required to meet a given network specification. 3. Use the OSI and TCP/IP models and their associated protocols to explain how data flows in a network. 4. Describe common networking applications, including web applications. 5. Describe the purpose and basic operation of the protocols in the OSI and TCP models. 6. Describe the impact of applications (Voice Over IP and Video Over IP) on a network. 7. Interpret network diagrams. 8. Determine the path between two hosts across a network. 9. Describe the components required for network and Internet communications. 10. Identify and correct common network problems at layers 1, 2, 3, and 7 using a layered model approach. 11. Differentiate between LAN/WAN operation and features. 12. Explain in detail the data communications in routed, TCP/IP, and Ethernet Internetworks. 13. Build, configure, and troubleshoot an Ethernet, TCP/IP, and LAN which includes hosts, hubs, routers, switches, and all necessary cabling. 	3	2	0
Implementation of a Small Switched Network	<ol style="list-style-type: none"> 1. Select the appropriate media, cables, ports, and connectors to connect switches to other network devices and hosts. 2. Explain the technology and media access control method for Ethernet technologies. 3. Explain network segmentation and basic traffic management concepts. 4. Explain the operation of Cisco switches and basic switching concepts. 5. Perform, save, and verify initial switch configuration tasks including remote access management. 6. Verify network status and switch operation using basic utilities (including ping, traceroute, telnet, SSH, arp, ipconfig), SHOW, and DEBUG commands. 7. Implement and verify basic security for a switch (port security, deactivate ports). 8. Identify, prescribe, and resolve common switched network media issues, configuration issues, auto negotiation, and switch hardware failures. 	6	4	0
Implementation of an IP Addressing Scheme and IP Services to Meet Network Requirements for a Small Branch Office	<ol style="list-style-type: none"> 1. Describe the need and role of addressing in a network, including classful subnetting, classless subnetting, variable length subnetting, and CIDR notation. 	4	6	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Implementation of a Small Routed Network	<ol style="list-style-type: none"> Describe basic routing concepts, including packet forwarding and router lookup process. Describe the operation of Cisco routers, including router bootup process, POST, and router components. Select the appropriate media, cables, ports, and connectors to connect routers to other network devices and hosts. Configure, verify, and troubleshoot RIPv2. Access and utilize the router CLI to set basic parameters. Connect, configure, and verify operation status of a device interface. Verify device configuration and network connectivity using ping, traceroute, telnet, SSH, or other utilities. Perform and verify routing configuration tasks for a static or default route given specific routing requirements. Manage IOS configuration files, including: save, edit, upgrade, restore. Manage Cisco IOS. Implement password and physical security. Verify network status and router operation using basic utilities (including ping, traceroute, telnet, SSH, arp, ipconfig), SHOW, and DEBUG commands. 	6	5	0
Explanation and Selection of the Appropriate Administrative Tasks Required for WLAN	<ol style="list-style-type: none"> Describe Virtual LAN concepts, including broadcast domains; 802.1Q, and ISL encapsulation techniques; Trunks; routing VLANs using subinterfaces; routing VLANs using layer 3 switches; and supporting VTP. 	4	5	0
Identification of Security Threats to a Network and General Methods to Mitigate Those Threats	<ol style="list-style-type: none"> Describe supporting dynamic address allocation using DHCP, including DHCP protocol messages types, managing addresses, creating pools, address leases, server configuration, and server verification. Describe Network Address Translation, including address conservation, private addresses, static NAT, Dynamic NAT, NAT overload, and NAT troubleshooting. 	4	5	0
Implementation and Verification of WAN Links	<ol style="list-style-type: none"> Describe different methods for connecting to a WAN. Configure and verify a basic WAN serial connection. 	3	3	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
30	30	0