



CSCI 40 - Cisco Networks Level I

Catalog Description

Transfer Status: CSU
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 first course in the globally recognized Cisco Certified Networking Associate (CCNA) curriculum introduces the architectures, models, protocols, and networking elements that connect users, devices, applications and data through the Internet and across modern computer networks - including IP addressing and Ethernet fundamentals. By the end of the course, students can build simple local area networks (LAN) that integrate IP addressing schemes, foundational network security, and perform basic configurations for routers and switches.

Objectives

- Upon successful completion of this course, the student should be able to:
1. Explain the advances in modern network technologies.
 2. Implement initial settings including passwords, IP addressing, and default gateway parameters on a network switch and end devices.
 3. Explain how network protocols enable devices to access local and remote network resources.
 4. Explain how physical layer protocols, services, and network media support communications across data networks.
 5. Calculate numbers between decimal and binary systems.
 6. Explain how media access control in the data link layer supports communication across networks.
 7. Explain how Ethernet operates in a switched network.
 8. Explain how routers use network layer protocols and services to enable end-to-end connectivity.
 9. Explain how ARP and ND enable communication on a local area network.
 10. Implement initial settings on a router and end devices.
 11. Calculate an IPv4 subnetting scheme to efficiently segment your network.
 12. Implement an IPv6 addressing scheme.
 13. Use various tools to test network connectivity.
 14. Compare the operations of transport layer protocols in supporting end-to-end communication.
 15. Explain the operation of application layer protocols in providing support to end-user applications.
 16. Configure switches and routers with device hardening features to enhance security.
 17. Implement a network design for a small network to include a router, a switch, and end devices.

Course Content

Topic Titles / Suggested Time Topic	
Lecture	
Topics	Lec Hrs
Networking Today	2.50
Basic Switch and Device Configuration	3.00
Protocols and Models	2.50
Physical Layer	2.00
Number Systems	1.00
Data Link Layer	2.00
Ethernet Switching	2.00
Network Layer	3.00
Address Resolution	1.00
Basic Router Configuration	2.00
IPv4 Addressing	3.00
IPv6 Addressing	2.00
ICMP	1.00
Transport Layer	1.50
Application Layer	1.50
Network Security Fundamentals	2.00

<u>Topics</u>	<u>Lec Hrs</u>
Build a Small Network	2.00

Total Hours: 34.00

Lab

<u>Topics</u>	<u>Lab Hrs</u>
Networking Today	3.00
Basic Switch and Device Configuration	3.50
Protocols and Models	3.00
Physical Layer	2.00
Number Systems	3.00
Data Link Layer	3.00
Ethernet Switching	3.00
Network Layer	4.00
Address Resolution	3.00
Basic Router Configuration	3.50
IPv4 Addressing	4.00
IPv6 Addressing	2.50
ICMP	2.00
Transport Layer	3.00
Application Layer	3.00
Network Security Fundamentals	3.00
Build a Small Network	2.50

Total Hours: 51.00

Methods of Instruction

- A. Demonstrations
- B. Homework: Students are required to complete two hours of outside-of-class homework for each hour of lecture
- C. Lecture
- D. Multimedia Presentations
- E. Systems Administration Degree/ Certificate Program.
An option for the Advanced CyberSecurity Practitioners Degree/Certificate program.

Methods of Evaluation

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

Examples of Assignments

Reading Assignments

1. Read the white paper "Defeating DDoS Attacks" from the link provided by your instructor. Be prepared to explain in class how network security controls can help in prevention.
2. Read the Routers and Switches selection guide on the Cisco Support site. Compare and contrast the 1800 Series Integrated Services Router, and the 2800 Series Integrated Services Routers. Be prepared to discuss your findings in class.

Writing Assignments

1. Enumerate and explain in a one page document, the purpose of each of the three operating permissions environments available in Cisco Routers.
2. In a one page document, explain what occurs at each step of the router boot sequence.

Out-of-Class Assignments

1. Analyze and compare the IP route traces to Cisco, Yahoo, and Microsoft. Answer the following questions: What are the differences in traces? Why are they always the same in the beginning? Did you discover any latency issues and if so, where? Be prepared to share your findings in class.
2. Analyze and document your home network. Include all devices that have IP addresses or are connected. Submit your work to your instructor.

Recommended Materials of Instruction

Other Learning Materials

Required Access to Online Cisco Networking Academy.

Minimum Qualifications

Computer Service Technology

Computer Information Systems

Computer Science (Masters Required)

Created/Revised by: Fischer, Linda

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