



CSCI 19 - Computer Networking Fundamentals

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: This course introduces the architecture, structure, functions, components, and models of the Internet and other computer networks. Students achieve a basic understanding of how networks operate and how to build simple local area networks (LAN), perform basic configurations for routers and switches, implement Internet Protocol (IP) and enterprise technologies, including cloud and virtualization. Students will apply the knowledge and skills required to troubleshoot, configure, and manage common network devices; establish basic network connectivity; and implement network security, standards, and protocols. Preparation for the CompTIA Network+ certification exam. A virtualized lab component using NDG NETLabs+ will be included. (C-ID ITIS 150).

Objectives

Upon successful completion of this course, the student should be able to:

1. Configure switches and end devices to provide access to local and remote network resources.
2. Explain how physical and data link layer protocols support the operation of Ethernet in a switched network.
3. Configure routers to enable end-to-end connectivity between remote devices.
4. Create IPv4 and IPv6 addressing schemes and verify network connectivity between devices.
5. Explain how the upper layers of the OSI model support network applications.
6. Configure a small network with security best practices.
7. Troubleshoot connectivity in a small network.

Course Content

Topic Titles / Suggested Time Topic	
<u>Lecture</u>	
<u>Topics</u>	<u>Lec Hrs</u>
Networking Concepts	5.00
Network Operations, including: Protocols and Models, Physical Layer, Number Systems, Data Link Layer and Ethernet Switching.	8.00
Network Layer including: Address Resolution, Internet Protocol version 4 (IPv4) Addressing, Internet Protocol version 6 (IPv6) Addressing, Internet Control Message Protocol (ICMP).	7.00
Transport Layer	3.00
Application Layer	2.00
Network Troubleshooting and Tools	5.00
Network Security Fundamentals	4.00
Total Hours:	34.00
<u>Lab</u>	
<u>Topics</u>	<u>Lab Hrs</u>
Networking Concepts	7.00
Network Operations including: Protocols and Models, Physical Layer, Number Systems, Data Link Layer, and Ethernet Switching.	12.00
Network Layer including: Address Resolution, Internet Protocol version 4 (IPv4) Addressing, Internet Protocol version 6 (IPv6) Addressing, Internet Control Message Protocol (ICMP).	10.00
Transport Layer	6.00
Application Layer	4.00
Network Troubleshooting and Tools	7.00
Network Security Fundamentals	5.00
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. Computer System Administration

Methods of Evaluation

- A. Exams/Tests
- B. Quizzes
- C. Oral Presentation
- D. Lab Projects
- E. Essays and research papers

Examples of Assignments

Reading Assignments

1. Research the features of a Cisco Catalyst 2960 24 port switch and a HP Procurve 5820 24 port switch. Be ready to discuss the feature similarities and differences with the class.
2. Read the article provided by the instructor about the Internet of Things and how it will impact networking. Write a one page essay; be prepared to discuss your findings in class.

Writing Assignments

1. Write a two page report comparing the TCP/IP networking Model with the OSI Model and the benefits of each. Explain the reasoning behind why they divide the layers differently. Submit your work electronically.
2. Write a two page report on an Internet Pioneer, explain what they did, why they did it, and the impact it has had on development. Present what you learned to the class.

Out-of-Class Assignments

1. Visit a local computer retailer. Find out what types of networking equipment they sell and their knowledge of the products. Be prepared to discuss with the class whether that equipment would be adequate for a small or medium size business, and what might be an alternative retailer.
2. Research ISPs in Chico to find pricing, speeds, and availability for Internet access for a small business. Write a paragraph supporting the best service plan.

Recommended Materials of Instruction

Sequeira, A. (2018). CompTIA Network+ N10-007 Cert Guide. *Pearson*, 1. 978-0789759818.
CompTIA Certmaster Learn and Labs. *CompTIA*, *Current*.

Other Learning Materials

Access to NDG Netlabs+ online virtualized platform

Minimum Qualifications

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

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