LINC 94: INTRODUCTION TO COMPUTER NETWORKS

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2024
Units:	4
Hours:	3 lecture, 3 laboratory per week (72 total per quarter)
Advisory:	Basic computer skills and knowledge of Macintosh or Windows operating systems, and basic skills and knowledge of internet technologies, such as using web browsers, email, bookmarking, searching, and downloading.
Degree & Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	CSU
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Student Learning Outcomes

- Define and describe computer networks
- Explain purposes of computer networks
- Describe the OSI model

Description

Covers fundamental networking concepts and develops the skills and knowledge to set up and maintain small business/home networks. The course is not hardware or vendor specific. Helps students prepare for the "Network +" certification exam, an industry-wide, vendor-neutral certification program developed and sponsored by the Computing Technology Industry Association (CompTIA).

Course Objectives

The student will be able to:

1. Define and describe computer networks
2. Explain purposes of computer networks
3. Describe the OSI model
4. Explain how Ethernet and CSMA/CD function
5. Explain the functions of networking hardware: repeaters, bridges, Ethernet cabling systems
6. Analyze and compare Ethernet and non-Ethernet networks
7. Describe physical network installation procedures
8. Configure a wireless network
9. Identify and explain networking protocols
10. Explain IP addressing and configure subnets in a given network
11. Compare various network operating systems
12. Explain the roles of DHCP and DNS in a TCP/IP network
13. Analyze how different networking operating systems can be interconnected
14. Describe the ideal server
15. Demonstrate the proper troubleshooting procedure to analyze common network problems

Course Content

1. Defining networking
    a. The goal of networking
    b. Servers and clients
    c. Making shared resources usable
2. Building a network with OSI
    a. NICs
    b. Network software
    c. OSI seven layer model
3. Hardware concepts
    a. Hybrid topologies
    b. Cabling
    c. Networking industry standards—IEEE
4. Ethernet basics
    a. How Ethernet works
    b. CSMA/CD
    c. Ethernet cabling systems
    d. Extending the network: repeaters and bridges
5. Modern Ethernet
    a. 10BaseT topology
    b. Connecting Ethernet segments
    c. High-speed Ethernet
6. Non-Ethernet networks
    a. Logical Token Ring
    b. LAN to WAN—FDDI and ATM
7. Installing a physical network
    a. Structured cabling
    b. Testing the cable runs
    c. Beyond the basic star
    d. NICs
    e. Diagnostics and repair of physical cabling
8. Wireless networking
    a. Wireless networking basics
    b. Wireless networking standards
    c. Configuring wireless networking
    d. Troubleshooting wireless networks
9. Network protocols
    a. Implementing protocols
    b. NetBIOS/NetBEUI
    c. IPX/SPX
    d. TCP/IP
        i. IP address basics
        ii. Address format
    e. Also Ran protocols
    f. Local vs. remote
10. Subnet masks and subnetting

      a. Other critical TCP/IP settings

      b. IP ports

      c. IPv6

11. Network operating systems
    a. Categorizing operating systems
      i. Client/server vs. peer-to-peer
    b. The major network operating systems
    c. Creating servers and clients
      i. Sharing resources
      ii. Resource naming
      iii. Permissions
      iv. Sharing resources
      v. Accessing shared resources

12. Going large with TCP/IP
    a. DNS
    b. DHCP
    c. WINS
    d. Diagnosing TCP/IP networks
    e. TCP/IP and the internet
    f. Real world routers
    g. Connecting to the internet
    h. TCP/IP applications

13. Interconnecting network operating systems
    a. Connecting to Windows
    b. Connecting to NetWare
    c. Connecting to Macintosh
    d. Connecting to Unix/Linux

14. The perfect server
    a. Protection of data-fault tolerance
    b. Speed
    c. Reliability

15. The art of network support
    a. Troubleshooting tools
    b. The troubleshooting process
    c. Troubleshooting scenarios

Lab Content

1. Networking Lab
2. Network Hardware Lab
3. Ethernet Lab
4. Installing Physical Network Lab
5. Installing a Wireless Network Lab
6. Network Protocols Lab
7. Network Operating Systems Lab
8. Router Lab
9. Interconnecting Network Operating Systems Lab
10. Network Troubleshooting Lab

Special Facilities and/or Equipment

1. When offered on/off campus: Lecture room equipped with projector, whiteboard, and a demonstration computer connected online. Computer laboratories equipped with computers or laptops with internet access.

2. When taught via the internet: Students must have current email accounts and ongoing access to computers with web browsing capability and internet access.

Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

Completed lab projects and reports
Class performance with demonstrations
Quizzes
Final exam

Method(s) of Instruction

Methods of Instruction may include but are not limited to the following:

Students will actively take notes during lectures and demonstrations
Students will be actively engaged in individual learning practices
Students will conduct online research
Students will complete lab work
Students will meet with other students in one-on-one sessions or small group instruction

Representative Text(s) and Other Materials

Bell, Alexander. Computer Networking: Fundamentals for Absolute Beginners. 2020.

Instructor-assigned notes, materials, and resources, including instructional materials, open education resources, multimedia, and websites.

Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

1. Reading assignments include analysis of texts, selected examples, and student projects
2. Writing assignments include a course project and multiple developmental projects, reflections, discussion responses, and peer feedback on projects
3. Outside assignments include project planning and development, participation in online peer collaboration activities, and project development through an iterative process

When taught online, these methods may take the form of multimedia and web-based presentations. Assignments will be submitted online as well.

Discipline(s)

Computer Service Technology or Instructional Design/Technology