ITIS 107: NETWORK TECHNOLOGY

Citrus College Course Outline of Record

Heading	Value
Effective Term:	Fall 2024
Credits:	4
Total Contact Hours:	108
Lecture Hours :	54
Lab Hours:	54
Hours Arranged:	0
Outside of Class Hours:	108
Total Student Learning Hours:	216
Strongly Recommended:	ITIS 104; ENGL 101.
Transferable to CSU:	No
Transferable to UC:	No
Grading Method:	Standard Letter, Pass/No Pass

Catalog Course Description

This course provides information covering the LAN and WAN. Network topologies and protocols are presented. 54 lecture hours, 54 lab hours.

Course Objectives

- describe computer network development
- apply principles learned to situations in industry
- be able to accurately collect necessary information to prepare a laboratory report
- identify the characteristics of IPV4 and IPV6 standards
- identify the layers of the OSI model
- differentiate between analog and digital signals
- identify a variety of media types and their characteristics
- identify the functions, advantages, and disadvantages of repeaters, bridges, routers, and gateways
- identify key characteristics of the IEEE 802 standards
- identify the characteristics of the major protocols
- identify and construct copper and fiber cables to industry standards
- analyze and troubleshoot problems related to assembly and use of network cable systems

Major Course Content

1. History of Computer Networking
    a. Introduction
    b. Early development
    c. Enterprise and global networks
2. OSI Reference Model
    a. Physical layer
    b. Data link layer
    c. Network layer
    d. Session layer
    e. Presentation layer
    f. Application layer
3. Topologies
    a. Star
    b. Bus
    c. Ring
    d. Hybrid
    e. Mesh and Point to Point
4. Cabling
    a. Twisted pair cable
    b. Coaxial cable
    c. Fiber optic cable
    d. other
    e. fire rating
5. Ethernet Basics
    a. Ethernet
    b. Frames
    c. CSMA/CD
    d. Early Networks
    e. Switched
6. Modern Ethernet
    a. 100 Megabit
    b. Gigabit
    c. 10 Gigabit
    d. Backbones
7. Installing a Physical Network
    a. Structured cabling
    b. Installing Structured Cabling
    c. NIC's
8. TCP/IP Basics
    a. IP addressing
    b. Class ID
    c. CIDR and Subnetting
9. Routing
    a. Tables
    b. Network layer
    c. Network address translation
    d. Dynamic routing
    e. Connecting to routers
    f. Configuration
    g. Problems
10. TCP/IP Applications
    a. TCP
    b. UDP
    c. ICMP
    d. IGMP
    e. Ports
    f. Telnet/SSH
    g. Email
    h. FTP/SFTP
    i. Internet
11. Network Naming
    a. DNS
    b. Hosts files
    c. WINS
12. Securing TCP/IP

   a. Encryption
   b. Authentication
   c. Authorization
   d. security standards
   e. Secure TCP/IP applications
13. Advanced Networking Devices
   a. Client/Server and Peer to Peer
   b. VPN
   c. VLAN
   d. Multilayer Switches
14. IPv6
   a. Address notation
   b. Subnet masks
   c. enabling IPv6
   d. NAT in IPv6
   e. DHCP in IPv6
   f. DNS in IPv6
   g. tunnels
15. Remote connection Basics
   a. Telephony
   b. T1 and T3
   c. Fiber carriers
   d. Packet switching
   e. WAN
   f. DSL
   g. Cable
   h. Satellite
   i. Dial-up
   j. Private dial up
   k. VPN's
   l. Dedicated connection
16. Network Troubleshooting
   a. Hardware tools
   b. Software tools
   c. Troubleshooting Process
17. Wireless networking
   a. Wi-Fi Standards
   b. Implementing Wi-Fi
   c. Troubleshooting Wi-Fi
18. Network Security
   a. Threats
   b. User Accounts
   c. Firewalls
19. Network Management
   a. Network Configuration
   b. Monitoring Performance and Connectivity
   c. Network Optimization

Lab Content

1. OSI Level 2
   a. NIC cards
   b. MAC Address
2. Cabling Basics
   a. Male connectors
   b. Female connectors
   c. Punch panels
3. Testing network connections
   a. link lights
   b. testing cables
   c. checking the NIC
4. TCP/IP Basics
   a. IPv4 addressing
   b. Classes
5. Using IP addressing
   a. Static
   b. Dynamic
   c. Special
6. CIDR and Subnetting
7. SOHO routers
8. DNS
   a. Host file
   b. Loopback
9. TCP/IP Test Applications
   a. TCP
   b. UDP
   c. ICMP
   d. IGMP
10. Ports
11. TCP common Applications
   a. WWW
   b. Telnet
   c. FTP
   d. Email
12. Securing TCP/IP
   a. Authentication
   b. Authorization
   c. Encryption
13. VPN
14. IPv6
15. Remote connections
16. Network Troubleshooting
17. Wireless networking

Examples of Required Writing Assignments

Given a floor plan with specific hardware components and software programs itemized, write a paper describing the networking components used and the reason(s) why these components were selected. Include such factors as cost, make/model of components, size of room, etc.

Examples of Outside Assignments

Using the program Microsoft Visio, design a floor plan given a specific network topology. Determine the locations of all computer terminals, printers, etc. Make sure to map all of the cable runs.

Instruction Type(s)

Lab, Lecture, Online Education Lab, Online Education Lecture