ITNT-2300: NETWORKING FUNDAMENTALS

Cuyahoga Community College

Viewing: ITNT-2300 : Networking Fundamentals

Board of Trustees:
2015-05-28

Academic Term:
Spring 2021

Subject Code
ITNT - Info Tech-Networking Software

Course Number:
2300

Title:
Networking Fundamentals

Catalog Description:
Survey course into the fundamental topics and concepts of networks and network technologies. Topics include introductory content on networking standards, models and protocols, networking hardware, transmission methods and media, LANs, WANs, Wireless, VOIP, security, and network management issues. Serves as a preparation basis for the CompTIA Network+ exam.

Credit Hour(s):
3

Lecture Hour(s):
2
Lab Hour(s):
2

Requisites

Prerequisite and Corequisite
EET-1241 Digital Fundamentals, or concurrent enrollment; or IT-1025 Information Technology Concepts for Programmers, or concurrent enrollment; or departmental approval.

Outcomes

Course Outcome(s):
Define, understand, discuss, explain and utilize basic and fundamental networking concepts and procedures in a business information systems networking environment using the open systems interconnection (OSI) and transmission control protocol/internet protocol (TCP/IP) models, protocols, and technologies.

Objective(s):
1. Define various network terms and concepts.
2. Compare the benefits and limitations of different networking media.
3. Identify and explain the functions of the core TCP/IP protocols, DHCP and DNS.
4. Discuss addressing schemes (including IPv4, IPv6, subnetting and ports).
5. Describe and differentiate LAN and WAN topologies.
6. Describe and differentiate between types of data transmission switching.
7. Identify and differentiate between different networking devices and their functions.
8. Understand and explain the basic purposes of routing.
9. Explain and compare WAN technologies and topologies.
10. Understand, differentiate and explain Wireless LAN protocols, technologies and architectures.
11. Compare and evaluate network operating system characteristics and features.
12. Identify and distinguish between basic network topologies and types.
13. Describe the protocols used between mail clients and servers including POP3, IMAP and SMTP.
14. Describe and explain voice over IP and video over IP services and protocols.
15. Identify and describe the components of network security and wireless network security.
16. Define methods of encryption and secure data transmission.
17. Describe authentications protocols including KERBEROS, RADIUS, TACACS, CHAP and PAP.

18. Describe and explain the systematic troubleshooting methodology process and tools used.
19. Discuss issues related to ensuring data integrity and availability including malware, fault-tolerance, backup and recovery.
20. Identify and understand network management components and performance monitoring.
21. List elements common to all networks.
22. Identify networking standards organizations.
23. Describe and explain the purpose and functions of the OSI model and each of its layers.
24. Understand node to node communication through the OSI model.
25. Discuss the structure and purpose of data packets and frames.
26. Explain basic data transmission concepts.
27. Describe the characteristics of various networking media.

Methods of Evaluation:

1. Class participation and discussion
2. Oral and/or written reports
3. Homework assignments
4. Hands-on computer exercises / projects
5. Quizzes
6. Objective examinations
7. Other methods deemed appropriate by the department

Course Content Outline:

1. Network topologies including;
   a. LANs, MANs, WANs, Wireless LANs
   b. Client/server, peer-to-peer
   c. Ring, bus, star, hybrid, others
   d. Physical and logical
   e. Circuit switched and packet switched
2. Networking standards, and organizations
   a. Ethernet, 802.3
   b. Wireless, 802.11a,b,g,n
   c. WiMax 802.16
   d. Bluetooth 802.15
3. The OSI model and its layers
   a. Application layer
   b. Presentation layer
   c. Session layer
   d. Transport layer
   e. Network layer
   f. Data Link layer
   g. Physical layer
4. Networking protocols
   a. TCP/IP
   b. UDP
   c. ICMP
   d. ARP, RARP
   e. DHCP, BOOTP, APIPA
   f. DNS System
   g. Addressing IPv4, IPv6
      i. Subnetting and related topics
   h. PING, FTP, TFTP, Telnet and other application layer protocols
   i. Ports and sockets
   j. Ethernet, CSMA/CD, CSMA/CA
5. Network data transmission basics and media
   a. Coax
   b. Twisted pair
   c. Fiber
   d. Wireless
   e. WAN technologies

i. PSTN
ii. X.25 and Frame Relay
iii. ISDN
iv. DSL
v. Broadband Cable
vi. ATM
vii. SONET

f. Remote access

6. Internetworking devices
   a. Repeaters and hubs
   b. Bridges and switches
   c. Routers
7. Network security topics
   a. Risks
   b. Policies
   c. Physical security
   d. Malware
   e. Network design issues
   f. Encryption
   g. Authentication
   h. VPNs
   i. Wireless
8. Voice and video over IP
   a. H.323
   b. RTP, RTCP
9. Network operating systems
   a. Windows server (2003, 2008, or equivalent)
   b. UNIX and Linux, (or equivalent)
10. Network management topics / tools
    a. Baselines
    b. Fault and performance
    c. Fault tolerance
    d. Asset management
    e. Data backup
    f. Data recovery
    g. Change management
11. Troubleshooting networks
    a. Methodologies
    b. Troubleshooting tools

Resources

Dean, Tamara. *Network+ Guide to Networks.* 5th ed. Boston, MA: Course Technology, 2010.

White, Curt M. *Data Communications and Computer Networks, A Business User's Approach.* 6th ed. Boston, MA: Course Technology, Cengage Learning, 2011.

Graves, Michael. *The Complete Guide to Servers and Server+.* Clifton Park, NY: Delmar Cengage Learning, 2009.

Tomasi, Wayne. *Introduction to Data Communications and Networking.* Upper Saddle River, N.J. : Pearson Prentice Hall, 2005.

Dean, Tamara. *Network+ Guide to Networks.* 4th ed. Boston, MA: Course Technology, 2006.

Instructional Services

OAN Number:
CTAN Approved: Career Technical Assurance Guide CTIT002

Top of page
Key: 2565