



Course Number and Title: CIS 196 – Computer Networking II

Campus Location:

Wilmington

Effective Date:

2018-51

Prerequisite:

CIS 146

Co-Requisites:

none

Course Credits and Hours:

4.00 credits

3.00 lecture hours/week

2.00 lab hours/week

Course Description:

This course is part two of a two-course series that focuses on the terminology, fundamentals, design, installation, maintenance, and support of the local area networks (LAN). Topics include selecting LAN interface cards, cable, wiring plans, server hardware, and operating system software; configuring and installing two or more different LANs; maintaining LANs; integrating LANs into existing networks; and isolating LAN software and hardware problems.

Required Text(s):

Obtain current textbook information by viewing the [campus bookstore - https://www.dtcc.edu/bookstores](https://www.dtcc.edu/bookstores) online or visit a campus bookstore. Check your course schedule for the course number and section.

Additional Materials:

None

Schedule Type:

Classroom Course

Disclaimer:

None

Core Course Performance Objectives (CCPOs):

1. Describe the benefits of a hierarchical local area network (LAN) design and the functions of devices at each level of the hierarchy. (CCC 1, 2, 5, 6; PGC 6)
2. Describe the basic functions of switches. (CCC 1, 2; PGC 6)
3. Plan, configure, and integrate two or more LANs by completing a series of laboratory exercises. (CCC 2, 5, 6; PGC 6)
4. Describe and evaluate current wide area network (WAN) technologies. (CCC 1, 2, 5; PGC 6)
5. Describe basic network security, and implement access control lists. (CCC 1, 2, 6; PGC 6)
6. Describe and implement Internet Protocol (IP) addressing services such as network address translation (NAT) and Dynamic Host Configuration Protocol (DHCP). (CCC 1, 2, 6, 7; PGC 6)
7. Troubleshoot LAN and WAN problems. (CCC 2, 6; PGC 6)

See Core Curriculum Competencies and Program Graduate Competencies at the end of the syllabus. CCPOs are linked to every competency they develop.

Measurable Performance Objectives (MPOs):

Upon completion of this course, the student will:

1. Describe the benefits of a hierarchical local area network (LAN) design and the functions of devices at each level of the hierarchy.
 1. Describe the importance, benefits, role, impact, and components of virtual private network (VPN) technology.
 2. Describe standards associated with wireless media such as Institute of Electrical and Electronics Engineers (IEEE), wireless fidelity (Wi-Fi), Alliance and International Telecommunications Union/Federal Communication Commission (ITU/FCC).
 3. Describe common wireless-network implementation issues such as interference and misconfiguration.
 4. Describe the impact of Voice over Internet Protocol (VoIP) and Video over Internet Protocol (VoIP) applications on a network.
 5. Identify and describe the purpose of the components in a small wireless network, such as service set identifier (SSID), basic service set identification (BSSID), and extended service set identification (ESSID).
2. Describe the basic functions of switches.
 1. Explain the technology and media access control method for Ethernet networks.
 2. Explain basic switching concepts and the operation of Cisco switches.
 3. Perform and verify initial switch configuration tasks, including remote access management.
 4. Describe enhanced switching technologies such as virtual local area networks (VLANs), VLAN Trunking Protocol (VTP), Rapid Spanning Tree Protocol (RSTP), Per-VLAN Spanning Tree Protocol (PVSTP), and 802.1q.
3. Plan, configure, and integrate two or more LANs by completing a series of laboratory exercises.
 1. Manage Cisco Internetwork Operating System (IOS)® Software.
 2. Manage Cisco IOS configuration files (save, edit, upgrade, and restore).
 3. Describe how VLANs create logically separate networks and how routing occurs between them.
 4. Interpret the output of various show and debug commands to verify the operational status of a Cisco switched network.
 5. Verify network status and switch operation using basic utilities such as ping, traceroute, telnet, Secure Shell (SSH), Address Resolution Protocol (ARP), and ipconfig, as well as the show and debug commands.
 6. Interpret network diagrams.
 7. Select the appropriate media, cables, ports, and connectors to connect switches to other network.
4. Describe and evaluate current wide area network (WAN) technologies.
 1. Describe different methods for connecting to a WAN.
 2. Configure and verify a basic WAN serial connection.
 3. Configure and verify a Point-to-Point Protocol (PPP) connection between Cisco routers.
 4. Configure and verify frame relay on Cisco routers.
 5. Troubleshoot WAN implementation issues.
5. Describe basic network security, and implement access control lists.
 1. Describe current network security threats, and explain how to implement a comprehensive security policy to mitigate common threats to network devices, hosts, and applications.
 2. Describe the functions of common security appliances and applications.
 3. Describe recommended security practices to secure network devices.
 4. Describe the purpose and types of access control lists (ACLs).
 5. Configure and apply ACLs based on network filtering requirements.
 6. Configure and apply ACLs to limit telnet and SSH access to the router using the Security Device Manager/Command-line Interface (SDM/CLI).
 7. Verify, monitor, and troubleshoot ACLs in a network environment.
 8. Implement basic switch security measures such as port security, trunk access, and management VLANs.
 9. Compare and contrast Wi-Fi Protected Access (WPA) security features and capabilities of open, Wired Equivalent Privacy (WEP), and WPA-1/2 networks.
6. Describe and implement Internet Protocol (IP) addressing services such as network address translation (NAT) and Dynamic Host Configuration Protocol (DHCP).
 1. Explain the basic operation of NAT.
 2. Configure NAT for given network requirements using SDM/CLI.
 3. Explain the operation and benefits of DHCP and Domain Name Service (DNS).
 4. Configure, verify, and troubleshoot DHCP and DNS operations on a router.
7. Troubleshoot LAN and WAN problems.
 1. Troubleshoot NAT issues.
 2. Identify and correct common network problems at layers 1, 2, 3, and 7 using a layered model approach.
 3. Identify basic configuration parameters on a wireless network to ensure that devices connect to the correct access points.
 4. Identify, prescribe, and resolve common switched network media issues, configuration issues, autonegotiation, and switch hardware failures.
 5. Configure, verify, and troubleshoot VLANs, trunking on Cisco switches, inter-VLAN routing, VTP, and RSTP.

Evaluation Criteria/Policies:

Students must demonstrate proficiency on all CCPOs at a minimal 75 percent level to successfully complete the course. The grade will be determined using the Delaware Tech grading system:

92	-	100	=	A
83	-	91	=	B
75	-	82	=	C
0	-	74	=	F

Students should refer to the [Student Handbook - https://www.dtcc.edu/handbook](https://www.dtcc.edu/handbook) for information on the Academic Standing Policy, the Academic Integrity Policy, Student Rights and Responsibilities, and other policies relevant to their academic progress.

Core Curriculum Competencies (CCCs are the competencies every graduate will develop):

1. Apply clear and effective communication skills.
2. Use critical thinking to solve problems.
3. Collaborate to achieve a common goal.
4. Demonstrate professional and ethical conduct.
5. Use information literacy for effective vocational and/or academic research.
6. Apply quantitative reasoning and/or scientific inquiry to solve practical problems.

Program Graduate Competencies (PGCs are the competencies every graduate will develop specific to his or her major):

1. Install, configure and secure computer applications and operating systems.
2. Design, write, and debug computer programs.
3. Design and integrate databases in computer programs
4. Analyze and design complex computer applications to solve business problems.
5. Integrate the principles of the Internet into web development.
6. Incorporate the principles of networking and information security in computer application development.

Disabilities Support Statement:

The College is committed to providing reasonable accommodations for students with disabilities. Students are encouraged to schedule an appointment with the campus Disabilities Support Counselor to request an accommodation needed due to a disability. A listing of campus Disabilities Support Counselors and contact information can be found at the [disabilities services - https://www.dtcc.edu/disabilitysupport](https://www.dtcc.edu/disabilitysupport) web page or visit the campus Advising Center.