

DCOM 251

Local Area Networks

4 Credits

Community College of Baltimore County
Common Course Outline

Description

DCOM 251 – Local Area Networks: explores planning, installing, configuring, administering, and troubleshooting a computer network through hands-on exercises and lecture materials that cover the fundamental building blocks that form a modern network. Topics include protocols, topologies, hardware, and network operating systems. This class is intended to serve the needs of students who are interested in understanding foundational, vendor-independent networking concepts, as well as those interested in taking the Computing Technology Industry Association's (CompTIA) Network+ certification exam.

Pre-requisites: DCOM 101 or permission of the Program Coordinator

Overall Course Objectives

Upon completion of this course, students will be able to:

1. summarize the Open Systems Interconnection (OSI) and Transmission Control Protocol/Internet Protocol (TCP/IP) networking models;
2. describe the properties of network traffic;
3. install networks using switches;
4. configure networks using switches;
5. configure networks using Internet Protocol (IP);
6. install networks using routers;
7. configure networks using routers;
8. configure network ports and protocols;
9. monitor network ports and protocols;
10. explain network applications and network storage services;
11. monitor network performance;
12. troubleshoot network issues;
13. summarize network attacks and mitigation strategies;
14. install network security devices;
15. configure network security devices;
16. explain authentication and network access controls;
17. deploy network cabling;
18. troubleshoot network cabling;
19. implement wireless network technologies;
20. troubleshoot wireless network technologies;
21. differentiate between Wide Area Network (WAN) technologies;
22. use remote access technology; and
23. implement organizational policies using industry standard best practices and procedures.

The Common Course Outline (CCO) determines the essential nature of each course.

For more information, see your professor's syllabus.

Major Topics

- I. Networking Models
 - a. OSI Model Layers
 - b. TCP/IP Protocol Suite
- II. Network Traffic
 - a. Network Media Types
 - b. Network Access Methods
 - c. Ethernet Standards
 - d. Network Interfaces
- III. Switched Networks
 - a. Hubs
 - b. Bridges
 - c. Switches
 - d. Network Topologies
 - e. Network Types
- IV. IP Networks
 - a. Internet Protocol version 4 (IPv4) Addressing
 - b. IP Interfaces
 - c. IPv4 Subnets
 - d. Private and Public IP Addressing
 - e. Internet Protocol version 6 (IPv6) Addressing
 - f. Dynamic Host Configuration Protocol (DHCP)
- V. Routing Concepts
 - a. Routed Networks
 - b. Routing Devices
 - c. Routing Tables
 - d. Routing Protocols
- VI. Ports and Protocols
 - a. Port Scanners
 - b. Protocol Analyzers
 - c. Name Resolution Services
 - d. Domain Name System (DNS)
 - e. IP Address Management (IPAM)
- VII. Network Applications and Storage Services
 - a. Network Applications
 - b. Voice Services
 - c. Advanced Networking Devices
 - d. Virtualization
 - e. Network Storage Services
 - f. Cloud Services
- VIII. Monitoring Networks
 - a. Network Interfaces
 - b. Logs
- IX. Network Troubleshooting
 - a. Troubleshooting Networks
- X. Networking Attacks and Mitigations
 - a. Networking Attacks
 - b. Virtual Local Area Networks (VLAN)

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- c. Network Address Translation (NAT)
 - d. Port Forwarding
- XI. Security Devices
 - a. Firewalls
 - b. Proxies
 - c. Intrusion Detection Systems (IDS)
 - d. Intrusion Prevention Systems (IPS)
 - e. Unified Threat Management (UTM)
- XII. Authentication and Access Controls
 - a. Authentication
 - b. Authentication Protocols
 - c. Directory Services
 - d. Port Security
 - e. Network Access Control (NAC)
 - f. Network Device Hardening
 - g. Patch Management
 - h. Vulnerability Scanning
- XIII. Cabling Solutions
 - a. Structured Cabling
 - b. Twisted Pair Cabling
 - c. Fiber Optic Cabling
- XIV. Wireless Technologies
 - a. Wireless Performance Issues
 - b. Wireless Connectivity
- XV. WAN Technologies
 - a. WAN Core Services
 - b. WAN Subscriber Services
 - c. WAN Framing Services
 - d. Internet of Things (IoT) WAN
- XVI. Remote Access
 - a. Virtual Private Networks (VPN)
 - b. Remote Access
- XVII. Policies and Best Practices
 - a. Network Documentation
 - b. Network Diagrams
 - c. Physical Security
 - d. Business Continuity
 - e. Disaster Recovery

Course Requirements

Grading will be determined by the individual faculty member, but shall include the following, at minimum:

- 16 quizzes
- 15 hands-on lab projects
- Midterm exam
- Final exam

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