

**Course Outline**  
**DCOM 219**  
**Cisco III: Routing, Switching and Security**  
**4 Semester Hours**

**The Community College of Baltimore County**

**Description**

Cisco III - Routing, Switching and Security

Introduces new content and extends previously learned networking skills with emphases on Cisco routing and switching equipment; covers switches, Local Area Networks (LAN's), and Virtual Local Area Networks (VLAN's) design, configuration, and maintenance.

Corequisite: DCOM 218

**Overall Course Objectives**

Upon completion of this course the student will be able to:

- A. List the required IPX address and encapsulation type.
- B. Configure IPX access lists and SAP filters to control basic Novell traffic.
- C. Enable the Novell IPX protocol and configure interfaces.
- D. Monitor Novell IPX operation on the router.
- E. Describe the advantages of LAN segmentation.
- F. Describe LAN segmentation using bridges.
- G. Describe LAN segmentation using routers.
- H. Describe LAN segmentation using switches.
- I. Name and describe two switching methods.
- J. Describe full- and half-duplex Ethernet operation.
- K. Describe network congestion problem in Ethernet networks.
- L. Describe the benefits of network segmentation with bridges.
- M. Describe the benefits of network segmentation with routers.
- N. Describe the benefits of network segmentation with switches.
- O. Describe the features and benefits of Fast Ethernet.
- P. Describe the guidelines and distance limitations of Fast Ethernet.
- Q. Distinguish between cut-through and store-and-forward LAN switching.
- R. Describe the operation of the Spanning Tree Protocol and its benefits.
- S. Describe the benefits of virtual LANs.

## **Major Topics**

- A. The OSI Model and Routing
  - 1. Layered Network Model
  - 2. Physical Layer Detailed
  - 3. Data Link Layer Detailed
  - 4. Network Layer Detailed
  - 5. Network Layer: Path Determination
  - 6. Transport Layer Detailed
  - 7. Routing
  - 8. Routing Protocols
  - 9. LAN-to-LAN Routing
  - 10. Router Configuration
- B. LAN Switching
  - 1. Congestion and Bandwidth
  - 2. Why Segment LANs?
  - 3. Segmentation with LAN Switches
  - 4. LAN Switching Overview
  - 5. How a LAN Switch Learns Addresses
  - 6. Symmetric Switching
  - 7. Asymmetric Switching
  - 8. Two Switching Methods
- C. Virtual LANs
  - 1. Introduction to VLANs
  - 2. Frame Filtering
  - 3. Frame Tagging
  - 4. VLANs Establish Broadcast Domains
  - 5. Port-Centric Virtual LANs
  - 6. Static VLANs
  - 7. Dynamic VLANs
- D. LAN Design
  - 1. LAN Design Goals
  - 2. Design Methodology
  - 3. What Problem Are You Trying to Solve?
  - 4. Developing a LAN Topology
  - 5. Developing Layer 1 LAN Topology
  - 6. Extended Star Topology
  - 7. Developing Layer 2 LAN Topology
  - 8. Layer 2 - Switching
  - 9. Layer 3 Router for Segmentation
  - 10. Server Placement
- E. Routing Protocol
  - 1. Dynamic Routing Operations
  - 2. Representing Distance with Metrics
  - 3. Classes of Routing Protocols
  - 4. One Issue: Time to Convergence
  - 5. Distance Vector Concept
  - 6. Interior or Exterior Routing Protocols
  - 7. Interior IP Routing Protocols

8. IGRP Overview
  9. IGRP Configuration
  10. IGRP Configuration Example
- F. Access List Overview
1. What are Access Lists?
  2. How Access Lists Work
  3. A List of Tests: Deny or Permit
  4. How to Identify Access Lists
  5. Testing Packets with Access Lists
  6. How to Use Wildcard Mask Bits
  7. How to Use Wildcard Mask Bits (cont.)
  8. How to Use the Wildcard any
  9. How to Use the Wildcard host
  10. Where to Place IP Access Lists
- G. IPX Routing Overview
1. Cisco Routers in NetWare Networks
  2. Novell NetWare Protocol Suite
  3. Novell IPX Addressing
  4. Cisco Encapsulation Names
  5. Novell Uses RIP for Routing
  6. SAP Service Advertisements
  7. GNS Get Nearest Server Protocol
  8. Novell IPX Configuration Tasks
  9. Verifying IPX Operation

### **Course Requirements**

Grading/exams: Procedures for grading will be determined by the individual faculty member; there will be a *minimum* of 10 graded assignments. A final examination is required. Other graded assignments may come from any combination of the following categories: quizzes, hourly exams, a midterm exam, group projects, individual reports/presentations, or lab projects.

Writing: The individual faculty member will determine specific writing assignments.

### **Other Course Information**

This course is taught in a computerized environment.

This course is the third course in a series of four (4) in the CCNA (Cisco Certified Network Associate) concentration.

Individual faculty members may include additional course objectives, major topics, and other course requirements to the minimum expectations stated in the Common Course Outline.