

# **COURSE OUTLINE**

## **ELEC-261**

### **Introduction to Router Configuration**

3 Semester Hours

## **HOWARD COMMUNITY COLLEGE**

### **Description**

This course covers basic internetworking principles and configuration of routers for multiprotocol networks. Students will have hands-on experience in loading internet operating system, configuration and image files of routers. Students will also have hands-on experience in basic Cisco commands and configure Cisco routers for internetworking that uses LAN and WAN interfaces. This course will help you prepare for exams associated with CCIE (Cisco Certified Internetwork Expert) certification. Prerequisite: ELEC-260. (2 hours lecture, 3 hours lab)

### **Overall Course Objectives**

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

1. Evaluate the functionality of internetworking and how OSI model relates to multivendor networking.
2. Demonstrate with router basics setup and commands.
3. Install and configure Cisco routers.
4. Load Cisco configuration files and load Cisco internet operating system, configuration files and system images.
5. Describe how Cisco routers work with TCP/IP stack and address resolution.
6. Examine Cisco IP routing protocols - RIP and IGRP.
7. Configure successfully Cisco routers to work with the following transparent protocol - TCP/IP, Novell IPX, Appletalk.
8. Verify network routing using telenet and PING.
9. Demonstrate WAN connectivity and source-route bridging.
10. Examine router configuration from a TFTP host.

### **Major Topics**

- I. OSI Model/Introduction to Networking
  - A. Evolution of Internetworking
  - B. Internetworking Devices
  - C. The OSI Model
  - D. Purpose of Each Layer of OSI Model
  
- II. Install and Configure Cisco Routers
  - A. Locating IOS and Load IOS into Flash
  - B. Create Backup Copy of IOS
  - C. Router Basic Commands
  - D. Serial, Ethernet, Token Ring, FDDI Interface Configuration

- III. TCP/IP Configuration
  - A. TCP/IP Overview
  - B. IP Addressing
  - C. Subnet Addressing/Subnet Mask
  - D. Internet Control Message Protocol (ICMP)
  - E. ARP
  
- IV. Cisco Router Configuration for the Following Protocols:
  - A. TCP/IP
  - B. Novell/IPX
  - C. Appletalk
  
- V. Testing Router Configuration
  - A. Use Cisco Router Debugging Tools for Multiprotocol Routing
  - B. Telenet
  - C. Trace
  - D. Show Interface
  - E. Ping
  - F. Debug
  
- VI. WAN Connectivity and Bridging
  - A. ISDN
  - B. X.25
  - C. Frame Relay
  - D. Transparent Bridging
  - E. Source-Route Bridging

### **Course Requirements**

Grading/exams: Grading procedures will be determined by the individual faculty member but will be calculated on the basis of tests, lab reports, quizzes and final exam. This course includes a comprehensive final exam.

Writing: Each week, students are expected to write a laboratory report after performing that week's assigned experiments.

### **Other Course Information**

This course is a course in the Electronics Technology and Telecommunications Technology programs.