

COURSE OUTLINE

ELEC-260

Internetworking with Multi-Protocol Systems

3 Semester Hours

HOWARD COMMUNITY COLLEGE

Description

This course emphasizes the physical, datalink, and network layers of Local Area Networks (LANs) and Wide Area Networks (WANs). Topics include: network components employed in bus, ring, and star topologies; coaxial, twisted pair, and fiber optic transmission media; transmission standards and multiple protocol interfacing. Labs will include hands-on configuration of repeaters, bridges, routers, and gateways in client-server and peer-to-peer environments. SNMP network management tools will be used to configure, optimize, and troubleshoot stand-alone and internetworked systems. Prerequisites: ELEC-105 and CMSY-106 or ELEC-140 and CMSY-106. (2 hours lecture, and 3 hours lab)

Overall Course Objectives

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

1. Describe the origin of internetworking and the development of modern heterogeneous environments.
2. Define the functional components needed for internetworking.
3. Evaluate the core functionality of internetworking and compare it with the OSI model.
4. Describe LAN topology, major media transmission media, and the key function of repeaters, hubs, and concentrators.
5. Examine Different LAN protocols, and evaluate the interoperability of different network operating systems such as Novell network, Windows NT server, MAC, and TCP/IP.
6. Install and configure bridges for different network configuration.
7. Identify the causes of major network problems.
8. Effectively manage bridges, routers, and gateways using SNMP software.
9. Establish techniques for network hardware management and troubleshooting using SNMP software.
10. Examine new technologies and how to integrate them into existing systems.

Major Topics

- I. LAN Terminology
 - a. Different topologies
 - b. Different transmission media
 - c. Protocols
 - d. Use of repeaters, hubs and concentrators

- II. Internetworking-Basics
 - a. Need for internetworking
 - b. Core functionality of internetworking-terminal emulation, protocol conversions, file transfer
 - c. Internetworking devices--Gateways, Routers, Bridges, and Repeater

- III. Network operating systems and implementation
 - a. Major features of Novell netware 4.X
 - b. Major features of Windows NT Advanced Server
 - c. Major features of UNIX
 - d. Major features of MAC operating systems
 - e. Windows of Workgroups and Windows 95
- IV. Internetworking and Interoperability
 - a. Types of Bridges/Routers and their requirements
 - b. Installing and configuring Bridges/Routers
 - c. Implementing and configuring gateways
- V. Network management and troubleshooting using SNMP software
 - a. Identifying the causes of major network problems
 - b. Minimizing faults, maximizing performance and security
 - c. Identify typical alert messages and alarms
 - d. Adopt the best troubleshooting techniques
- VI. Future Trends and Development
 - a. What are the new technologies and how do they fit together?
 - b. What can you expect from interoperability?
 - c. High data rate networks
 - d. Wireless

Course Requirements

Grading/exams: Grading procedures will be determined by the individual faculty member but will be calculated on the basis of quizzes, projects, and a final exam.

Writing: Specific writing assignments will be determined by the individual faculty member.

Other course Information:

This course is a required course in the computer support technology program.