COURSE DESCRIPTION:

Prerequisites: NET 125
Corequisites: None

This course focuses on advanced IP addressing techniques, intermediate routing protocols, command-line interface configuration of switches, Ethernet switching, VLANs, STP, and VTP. Emphasis will be placed on application and demonstration of skills acquired in pre-requisite courses. Upon completion, students should be able to perform tasks related to VLSM, routing protocols, switching concepts and configuration, STP, VLANs, and VTP. Course Hours Per Week: Class, 1. Lab, 4. Semester Hours Credit, 3.

LEARNING OUTCOMES:

Upon successful completion of the course, students will be able to:

a. Explain basic switching concepts and switch operation
b. Describe switching technologies of VLANs, 802.1q, and Spanning Tree
c. Describe the logical operations of VLANs in separating networks and how routing occurs between them
d. Interpret network diagrams
e. Install, configure, verify, and troubleshoot switches and routers with VLANs, trunks, and Spanning Tree
f. Identify and correct common network problems at layers 1, 2, 3, and 7 using a layered model approach
g. Verify network status and problems using ping, traceroute, arp, and other utilities
h. Identify basic wireless networks and devices, including access points and end stations, along with potential implementation issues
i. Define SSID, BSS, ESS, beaconing, association, and authentication
j. Compare and contrast wireless encryption standards, including Open, WEP, and WPA, along with their variants
k. Configure Wi-Fi devices with basic parameters to ensure valid connections

OUTLINE OF INSTRUCTION:

I. LAN Design
   a. Switched LAN Architecture
   b. Matching Switches to Specific LAN Functions
II. Basic Switch Concepts and Configuration
   a. Introduction to Ethernet/802.3 LANs
   b. Forwarding Frames Using a Switch
   c. Switch Management Configuration
   d. Configuring Switch Security

III. VLANs
   a. Introducing VLAN
   b. VLAN Trunking
   c. Configure VLANs and Trunks
   d. Troubleshooting VLANs and Trunks

IV. VTP
   a. VTP Concepts and Operation
   b. Configure VTP

V. STP
   a. Redundant Layer 2 Topologies
   b. Introduction to STP
   c. STP Convergence
   d. PVST+, RSTP, and Rapid PVST+

VI. Inter-VLAN Routing
   a. Inter-VLAN Routing
   b. Configuring Inter-VLAN Routing
   c. Troubleshooting Inter-VLAN Routing

VII. Basic Wireless Concepts and Configuration
   a. The Wireless LAN
   b. Wireless LAN Security
   c. Configure Wireless LAN Access
   d. Troubleshooting Simple WLAN Problems.

REQUIRED TEXTBOOK AND MATERIALS:

Text to be assigned by the instructor each semester

STATEMENT FOR STUDENTS WITH DISABILITIES:

Students who require academic accommodations due to any physical, psychological, or learning disability are encouraged to request assistance from a disability services counselor within the first two weeks of class. Likewise, students who potentially require emergency medical attention due to any chronic health condition are encouraged to disclose this information to a disability services counselor within the first two weeks of class. Counselors can be contacted by calling 919-536-7207, ext. 1413 or by visiting the Student Development Office in the Phail Wynn Jr. Student Services Center, room 1209.