

I. CATALOG DESCRIPTION:

A. Departmental Information:

Division: Business and Information Technology
Department: Computer Information Technology
Course ID: CIT 097
Course Title: LAN Switching, Semester Seven (Cisco Networking Academy)
Units: 3
Lecture: 2 Hours
Laboratory: 3 Hours
Prerequisites: CIT 094

B. Course Description:

Cisco Semester Seven focuses on LAN Switching. The course will provide students with learning experiences in traditional campus networks, LAN media types, basic switch configurations, VLANs, Multilayer Switching, HSRP, Multicasting, and Restricting Network Access. This is the third in a series of four courses recommended for CCNP (Cisco Certified Network Professional) certification. (Formerly MIS 096)

C. Schedule Description:

Cisco Semester Seven teaches advanced concepts using switches connected in local area networks (LANs) typically found at small network sites. (Formerly MIS 096)

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: One

III. EXPECTED OUTCOMES FOR STUDENTS:

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

- A. Attain a working knowledge of the Campus Network and Design Models
- B. Configure LAN Media
- C. Configure the Switch
- D. Comprehend the Process of Spanning Tree Protocol (STP) and Redundant Links
- E. Configure Routing between VLANs
- F. Perform Multilayer Switching
- G. Configure and Operate Hot Standby Routing Protocol (HSRP)
- H. Configure Multicasting Routing Tasks
- I. Determine Basic Security and Policy Overview for Restricting Network Access

IV. CONTENT:

- A. Overview of the Campus Network and Design Models
 - 1. Overview of Campus
 - 2. Key Characteristics of Various Switching Technologies
 - 3. LAN Switching and the Hierarchical Model of Network Design
 - 4. Building-Block Approach
- B. LAN Media
 - 1. Fast Ethernet
 - 2. Gigabit Ethernet
 - 3. Determining Bandwidth Needs
- C. Configure the Switch
 - 1. Initial Connectivity to the Switch
 - 2. Basic Configuration of the Switch
 - 3. Important IOS Features
- D. Introduction to VLANs
 - 1. VLAN Basics
 - 2. VLAN Types
 - 3. Configuring VLANs

4. VLAN Identification
5. Trunking
6. VLAN Trunking Protocol (VTP)
7. VTP Configuration
8. VTP Pruning
- E. Spanning Tree Protocol (STP) and Redundant Links
 1. Basic STP Operations
 2. STP Processes
 3. VLANs and STP
 4. STP in the Campus Network
 5. Redundant Links
- F. Routing between VLANs
 1. VLAN Issues
 2. Route Switch Modules
 3. External Routers
- G. Multilayer Switching
 1. MLS Processes
 2. Basic MLS Configuration
 3. Flow Masks
 4. MLS on the Switch
- H. Hot Standby Routing Protocol (HSRP)
 1. HSRP Operation
 2. HSRP Configuration
- I. Multicasting
 1. Multicasting Overview
 2. IGMP
 3. Routing Multicast Traffic
 4. Multicast Routing Protocols
 5. Configure IP Multicast Routing
 6. Optional IP Multicast Routing Tasks
 7. Verifying CGMP
- J. Restricting Network Access
 1. Policy Overview
 2. Basic Security
 3. Policy Configuration

V. METHODS OF INSTRUCTION:

- A. Lecture
- B. Web-Based Instruction
- C. Interactive Labs
- D. Demonstration
- E. Group Activity

VI. TYPICAL ASSIGNMENTS:

- A. Web-based Interactive Labs
 1. Considering the following information, which of the statements below is true?
router eigrp 100
network 172.16.0.0
network 192.168.168.0
network 192.168.169.0.0.031
 - a. EIGRP is running on the router
 - b. Line 1 defines EIGRP as a routing process
 - c. Line 2 defines the network 172.16.0.0 mask 255.255.255.0 as being part of the eigrp network

- d. Line 3 defines all interfaces with an IP Address of 192.168.0/24 as being part of the EIGRP Process
- e. Networks other than the ones listed above will never enter the routing table
- 2. What configuration tasks must be performed to configure HSRP on an external router trunk link. (Choose 3)
 - a. Configure LANE
 - b. Define the ISL encapsulation format
 - c. Define the HSRP Virtual router IP address
 - d. Enable HSRP
 - e. Enable Routing
- B. Group Activity
 - 1. Given the output below, determine what type of router would be in use?
router ospf 100
redistribute rip metric 12 metric-type 1 subnets
network 172.16.0.0.0.255.255 area 1
network 192.168.10.0.0.0.255 area 0
 - 2. Configure the following:
 - a. Configure Central to accept incoming PPP calls and force CHAP authentication:
 - b. Configure a static route to the Ethernet network connected to the 700 series branch router
 - c. Ping Central's FastEthernet interface from the Branch router.
 - d. The pings should be successful. If the pings fail, troubleshoot as necessary.

VII. EVALUATION(S):

- A. Methods of Evaluation
 - 1. Objective Tests and Written Assignments
 - a. In an ISDN implementation, the U interface utilizes how many wires?
 - i. 1
 - ii. 2
 - iii. 3
 - iv. 4
 - b. What command enables Multilayer Switching on a Catalyst 500 RSM?
 - i. set mls enable
 - ii. set mls rp ip
 - iii. mls rp ip
 - iv. mls-rp ip
 - 2. Lab Activities
 - a. Use the ping utility to determine an appropriate access to a TACACS+ server. Scenario: The ITA has set up and configured CiscoSecure TACACS+ server and needs to plan the routers under the control of the TACACS+ server. You might need to modify the hostname and IP address of your router. Configure SanJose1 and confirm that SanJose1 can ping the TACACS+ server
 - b. Access a router bypassing conventional TACACS+ security. Scenario: If you did not know any of the valid username or password combinations stored on the TACACS+ server, determine how one could gain access to the router.
- B. Frequency of Evaluation
 - 1. On-line chapter examinations as each exercise/lesson is completed; the software provides immediate feedback and review
 - 2. Group work evaluated weekly
 - 3. Skill-based final examination
 - 4. On-line final exam for Semester Seven

San Bernardino Valley College
Curriculum Approved: February 2, 2004
Last Updated: January 2004

VIII. TYPICAL TEXT(S):

Cisco Systems, CCNP Cisco Network Academy Program: Multilayer Switching Companion Guide. Indianapolis, IN: Cisco Press, 2003.

IX. OTHER SUPPLIES REQUIRED OF STUDENTS: Zip Disk