San Bernardino Valley College
Curriculum Approved: September 9, 2002
Last Updated: August 2002

I. CATALOG DESCRIPTION:

A. Departmental Information:

Division:	Business and Information Technology
Department:	OIS/MIS
Course ID:	MIS 097
Course Title:	Network Troubleshooting, Semester Eight (Cisco Networking Academy)
Units:	3
Lecture:	2 Hours
Laboratory:	3 Hours
Prerequisites:	MIS 093

B. Course Description:
Cisco Semester Eight focuses on Network Troubleshooting. The course will provide students with learning experiences in troubleshooting methodologies. It will include Protocol Overview, Management and Diagnostic Tools, Troubleshooting TCP/IPS, LAN Switches, VLANs, Routing and Switching Processes, Frame Relay, ISDNs, and AppleTalk. This is the fourth in a series of four courses recommended for CCNP (Cisco Certified Network Professional) certification.

C. Schedule Description:
Cisco Semester Eight teaches troubleshooting concepts using switches connected in local area networks (LANs) typically found at small network sites.

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

III. EXPECTED OUTCOMES FOR STUDENTS:

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

A. Explain the Troubleshooting Model
B. Support Resources for Troubleshooting
C. Use Troubleshooting Methods
D. Identify Troubleshooting Targets
E. Apply Cisco Troubleshooting Tools
F. Document Symptoms, Actions and Results
G. Track Log-ins and Connections
H. Use Cisco Show and Debug Commands
I. Diagnose and Correct Campus TCP/IP, Catalyst, Frame Relay, and ISDN BRI Problems
J. Troubleshoot VLANs on Routers and Switches
K. Diagnose and Correct ISDN BRI Problems

IV. CONTENT:

A. Troubleshooting Model
   1. Problem Solving Model
   2. Define the Problem
   3. Gather facts
   4. List Possible Problems
   5. Develop an Action Plan
   6. Implement the Action Plan
   7. Observe the Results
   8. Repeat the Process as Necessary
   9. Solve the Problem

B. Protocol Overview
   1. Legacy Media Types
   2. Layer 2 Protocols
   3. Introduction to ATM
C. Management and Diagnostic Tools
   1. General Testing Equipment
   2. Network Management Software
   3. Router Diagnostic Commands
   4. Router Debugging
   5. Interaction with Technical Support
D. Troubleshooting TCP/IP
   1. TCP/IP Basics
   2. TCP/IP Diagnostic Tools
   3. TCP/IP Show Commands
   4. TCP/IP Debug Commands
   5. Troubleshooting a Windows NT Environment
E. Troubleshooting LAN Switches
   1. LAN Switch Hardware
   2. Spanning Tree and VLANS
   3. Switch Troubleshooting Tools
   4. Show Commands to Verify System Settings
   5. Show Commands for Switch Configuration
   6. Catalyst Symptoms and Problems
F. Troubleshooting VLANs
   1. VLAN Review
   2. VLAN Troubleshooting
   3. Route VLAN Show and Debug Commands
   4. Problem Isolation in VLAN Networks
G. Routing and Switching Processes
   1. Overview of Routing
   2. Switching Paths
   3. Performance Issues
   4. Troubleshooting the Router
H. Troubleshooting Frame Relay
   1. Troubleshooting Frame-Relay
   2. Troubleshooting Commands
I. Troubleshooting ISDN
   1. ISDN Basic Troubleshooting
   2. Troubleshooting Commands
   3. ISDN Debugging
J. APPLETALK
   1. AppleTalk Protocol Overview
   2. Configuring AppleTalk
   3. Show Commands
   4. Debug Commands
   5. Problem Isolation in AppleTalk
K. Novell IPX
   1. Novell Overview
   2. Novell Configuration Show Commands
   3. Debug Commands
   4. Problem Isolation in Novel Networks
L. Troubleshooting EIGRP
   1. EIGRP Neighbor Stability
   2. Stuck in Active
   3. Troubleshooting Commands

M. Troubleshooting OSPF
   1. Monitoring OSPF
   2. Debugging OSPF
   3. Logging information
N. Troubleshooting BGP
   1. Monitoring BGP
   2. Troubleshooting Peer Negotiation
   3. Troubleshooting Routing Updates
   4. Route Selection

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. Take the interactive quiz related to troubleshooting Peer Negotiation.
   2. Take the interactive quiz related to Apple Talk
B. Written Assignments
   1. In your engineering journal, record the three main characteristics of a VLAN
   2. In your engineering journal, list and define the Novell Configuration Show commands and Debug commands used for Novell IPX.

VII. EVALUATION(S):

A. Methods of Evaluation
   1. Objective Tests and Written Assignments
      a) List the seven steps necessary to configure a TCP load distribution.
      b) List and explain the three main characteristics of a VLAN.
   2. Lab Activities
      a) Configure a PVC using the encapsulation x25 and assign an X.121 address using the x25 address command.
      b) Configure IP between a 700 series route and a Cisco IOS router using PPP with CHAP authentication over ISDN.
   3. Problem Solving Exercises and Skills Demonstration:
      a) Demonstrate the ability to configure a router for the Apple Talk protocol by determining which commands provide you with the most complete documentation regarding the router's knowledge of the AppleTalk process.
      b) Analyze the exchange of information on a TCIP network by determining what will happen when the first packet from source A to destination B is through an MLS-RP and MLS-SE the response packet from B to A
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 Eight

VIII. TYPICAL TEXT(S):

McGregor, Mark, *CCNP Cisco Networking Academy Program: Remote Access Companion Guide;* 1st Ed., Cisco Press, Indianapolis, Indiana: 2002
Grice, Michael, *CCNP Guide to Advanced Cisco Routing,* 1st Ed., Course Technology, Thomson Learning, Inc., Boston, Massachusetts: 2001.

IX. OTHER SUPPLIES REQUIRED OF STUDENTS: Zip Disk