Course Outline

Fall 2005

Division: Information Technology

Program/Dept: Network Design and Administration

Course Number: IT 146 **Credits:** 5 **Variable:**

Course Title: Network Management - Cisco III

Inst. Intent: 21 Vocational Preparatory **CIP:** 11.0901

Fee: CL **Type:** Computer Lab Fee

Degree/Certificate Requirement: Yes
Name of Degree/
Certificate Requirements: Network Design and Administration—Certifcate/Cisco Alternative/AAS-T Programs

Distribution Requirements for AA/AAS: Yes

Transfer Status to 4-year Institution: No

If Yes, Please Describe:

Course Length: Based on 11 wks/qtr **Class Size:** 24

Course Contact Hours: 55

Lecture: 55 **Lab:** **Clinical:** **Other:**

Prerequisite: Yes **If Yes, Please Describe:** NET 142, NET 144 or instructor permission

Required Placement Tests: No **If Yes, Please Describe:**

Comments:

Course Description:
This is the third of three courses designed to introduce new content and extend previously learned networking skills, which will empower the student to enter the workforce. A task analysis of current industry standards and occupational analysis was used in the development of content standards. Instruction introduces and extends the student's knowledge and practical experience with configuring LAN's, Novell networks, Internetwork Packet Exchange (IPX) routing and Interior Gateway Routing Protocol (IGRP) protocols, WideArea Networks (WANs), and network troubleshooting. Integrated Services Data Networks (ISDN) and Point-to-Point Protocols(PPP) and Frame Relay design, configuration and maintenance.

Course Outcomes/Learning Objectives:

At the end of this quarter, the student will:

1. List the required IPX address and encapsulation type.
2. Configure IPX access lists and SAP filters to control basic Novell traffic.
3. Enable the Novell IPX protocol and configure interfaces.
4. Monitor Novell IPX operation on the router.
5. Describe the advantages of LAN segmentation.
6. Describe LAN segmentation using bridges.
7. Describe LAN segmentation using routers.
8. Describe LAN segmentation using switches.
9. Name and describe two switching methods.
10. Describe full- and half-duplex Ethernet operation.
11. Describe network congestion problem in Ethernet networks.
12. Describe the benefits of network segmentation with bridges.
13. Describe the benefits of network segmentation with routers.
14. Describe the benefits of network segmentation with switches.
15. Describe the features and benefits of Fast Ethernet.
16. Describe the guidelines and distance limitations of Fast Ethernet.
17. Differentiate between the following WAN services: LAPB, Frame Relay, ISDN/LAPD, HDLC, PPP, and DDR.
18. Recognize key Frame Relay terms and features.
19. List commands to configure Frame Relay LMIs, maps, and subinterfaces.
20. List commands to monitor Frame Relay operation in the router.
21. Identify PPP operations to encapsulate WAN data on Cisco routers.
22. State a relevant use and context for ISDN networking.
23. Identify ISDN protocols, function groups, reference points, and channels.
24. Describe Cisco's implementation of ISDN BRI.
25. Add the IGRP routing protocol to your configuration.
26. Configure standard access lists to figure IP traffic.
27. Monitor and verify selected access list operations on the router.
28. Configure extended access lists to filter IP traffic.
29. Monitor and verify selected access list operations on the router.

SCCC General Education Outcomes and/or Related Instructional Outcomes (for technical courses) Met by Course: (list each outcome):

Outcome 1. Think critically in reading and writing.
- A. Develop the attitudes that support problem solving and reasoning.
- B. Apply thinking skills to diagnose hardware problems.

Outcome 6. Work and communicate effectively in groups.
- A. Develop effective listening skills.
- B. Develop effective speaking skills.
- C. Develop skills to facilitate group work.

Topical Outline and/or Major Divisions:

I. LAN DESIGN

A. Define and explain each of the LAN design goals
B. Design a Local Area Network and justify and/or document the decisions
C. Set up a VLAN implementation plan
   1. Gather and analyze network requirements
   2. Analyze and document customer's LAN requirements
   3. Write and state the customer's problem
   4. Design a Network

II. Internet Gateway Routing Protocol (IGRP)

A. Explain Path determination in Network Layer
B. Compare and contrast Network Addresses and Host Addresses in Network Layer Addressing
C. Demonstrate IGRP Configuration tasks
D. Define and summarize the purpose of Routed versus Routing Protocols
E. Define and explain the difference in operation of Static versus dynamic protocol routing
F. Define, give the purpose and operational characteristics of the following:
   1. Autonomous system
   2. Internal/External Routing protocol
   3. IGRP
G. Illustrate and explain Composite Metric

III. ACCESS CONTROL LISTS

A. Define and describe the purpose and operation of:
   1. Standard Access lists
   2. Extended Access Lists
B. Create a list of deny/permit tests; explain the difference
C. Define and explain the function and operation of Wildcard masks bits
D. Summarize how to identify access lists
E. Explain and conduct the processes involved for testing packs with access lists
F. Create an IP access list using the following
   1. Wildcard mask bits
   2. Wildcard any
   3. Wildcard host

IV. NOVELL IPX

A. Explain the features of Cisco routers used in a Novell Network
B. Discuss the difference between Novell IPX and other networks
C. Configure a Novell Network using Novell IPX addresses
   1. Network Number
   2. Network Node
D. Name, define and summarize Cisco encapsulation names
E. Conduct a Novell RIP routing

V. Wide Area Networks (WAN)

A. Understand the basics of WANs including common WAN technologies, types of wide area services, encapsulation formats and link options.
B. Understand WAN link options
C. Understand the process and considerations for designing a hierarchical model of a WAN.

VI. Point-to-Point Protocol (PPP)

A. Understand the components, process, and operation of PPP communication.
B. Describe PPP's connection negotiation process

VII. Integrated Services Digital Network (ISDN)

A. Understand the services, standards, components, operation and configuration of ISDN communication.
B. Understand the process for configuring and verifying ISDN

VIII. Frame Relay

A. Understand the services, standards, components, operationand configuration of Frame Relay communication.
B. Understand and use the basic devices of Frame Relay.
C. Understand subinterface.

Course Requirements (Expectations of Students)

1. Attending class sessions
2. Reading as indicated by instructor
3. Completing course assignments as indicated by instructor
4. Completing course exams

Methods of Assessment/Evaluation:

Graded on projects, lab performance, online and skill based exams

Supplemental Text(s) and/or Materials:

At the instructor's discretion

Outline developed by: Wayne M Jarvimaki **Date:** 10/99

Revised by: DC Shoemaker **Date:** 12/09/99, 2/11/00, 9/11/03, 10,23/03
Lisa Sandoval 8-03-05