SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

Sault College

COURSE OUTLINE

COURSE TITLE: Network Certification III

CODE NO. :   CSN306   **SEMESTER:**   6

PROGRAM: Computer Network Technology

AUTHOR: Mark Allemang

DATE: Jan. 2001   **PREVIOUS OUTLINE DATED:**   Jan. 2000

APPROVED:

_____   _____
                                                                DEAN   DATE

TOTAL CREDITS: 6

PREREQUISITE(S):   None

HOURS/WEEK: 4

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I.   COURSE DESCRIPTION:

This course is a continuation of CSN301 WANS II. At the present time, this course will cover
Cisco CCNA semester 3 – "Advanced Router Configuration",   and Semester 4 – "WAN Theory
and Design."   A significant part of semesters 3 and 4 is the Threaded Case Study (TCS) in
which the student designs a large network from the basic LAN cabling up to selection of the
WAN services.

II.   LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course the student will demonstrate the ability to:

A. Recognize potential network congestion problems and overcome these problems through network segmentation.

   Potential Elements of the Performance:

1.   Describe the advantages of LAN segmentation.
2.   Describe LAN segmentation using bridges, routers and switches.
3.   Name and describe two switching methods.
4.   Describe full- and half-duplex Ethernet operation.
5.   Describe network congestion problem in Ethernet networks.
6.   Describe the features and benefits of Fast Ethernet.
7.   Describe the guidelines and distance limitations of Fast Ethernet.
8.   Describe the operation of the Spanning Tree Protocol and its benefits.

      This learning outcome will constitute approximately 15% of the course.
      Reference: Semester 3 Chapter(s) 2

B. Design and implement Virtual Lans

   Potential Elements of the Performance:

1.   Describe how switches can be used to implement VLANs
2.   Describe the benefits of VLANS
3.   Implement networks that incorporate virtual LANs.

      This learning outcome will constitute approximately 15% of the course.
      Reference: Semester 3 Chapter(s) 3

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C. Implement Access Control Lists (ACLs) in order to control access to network resources.

     Potential Elements of the Performance:

1. Describe the purpose of ACLs and how they are implemented in a router.
2. Describe the difference between standard and extended ACLs.
3. Design and implement ACLs in order to satisfy various access control/security requirements.

     This learning outcome will constitute approximately 15% of the course.
     Reference: Semester 3 Chapter(s) 6

D. Design a Wide Area Network solutions to satisfy a particular requirement.

     Potential Elements of the Performance:

1. Describe and utilize the hierarchical network design model
2. Analyze traffic types and requirements to be considered during WAN design.
3. Select from available WAN services including ISDN, Frame Relay

     This learning outcome will constitute approximately 10% of the course.
     Reference: Semester 4 Chapter(s) 2,3

E. Implement a WAN utilizing Frame Relay.

     Potential Elements of the Performance:

1. Describe key Frame Relay terms and features.
2. List commands to configure Frame Relay LMIs, maps, and subinterfaces.
3. List commands to monitor Frame Relay operation in the router.
     This learning outcome will constitute approximately 5% of the course.
     Reference: Semester 4 Chapter(s) 6

F. Describe the implementation of a WAN utilizing ISDN

     Potential Elements of the Performance:

1. State a relevant use and context for ISDN networking.
2. Identify ISDN protocols, function groups, reference points, and channels.
3. Describe Cisco's implementation of ISDN BRI.

     This learning outcome will constitute approximately 5% of the course.
     Reference: Semester 4 Chapter(s) 5

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G. Implement a serial link using PPP as the encapsulation protocol:

Potential Elements of the Performance:

1. Identify PPP operations to encapsulate WAN data on Cisco routers.
2. Configure a WAN router to use PPP, and implement CHAP authentication.

> *This learning outcome will constitute approximately 10% of the course.*
> Reference: Semester 4 Chapter(s) 4

H. Implement a network using IPX as the routed protocol

Potential Elements of the Performance:

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.

> *This learning outcome will constitute approximately 10% of the course.*
> Reference: Semester 3 Chapter(s) 7

I. Prepare and present the Threaded Case Study.

> *This learning outcome will constitute approximately 15% of the course.*
> Reference: Semesters 3 and 4 all chapters.

III.   TOPICS TO BE COVERED:

1.   Lan Segmentation
2.   VLANs
3.   Access Control Lists (ACLs)
4.   WAN Design
5.   Frame Relay
6.   ISDN
7.   PPP
8.   Novel IPX Routing
9.   Threaded Case Study

IV.   REQUIRED STUDENT RESOURCES/TEXTS:

TEXT BOOK:
- **"CCNA CERTIFICATION – ROUTING BASICS FOR CISCO CERTIFIED NETWORK ASSOCIATES EXAM."**
  by Robert N. Myhre (Prentice Hall 1999)

V.   EVALUATION PROCESS/GRADING SYSTEM:

Online Cisco Chapter exams   20%
Block Tests   20%
Final Cisco Exam   20%
Practical Tests   20%
Lab Activities   20%
(The percentages shown above may vary slightly if circumstances warrant.)

NOTE: It is necessary to pass both the theory and the lab part of this course. For example, it is not possible to pass the course if a student has a failing average in the written tests but is passing the lab portion, (or vice versa).

GRADING SYSTEM

A+	90	-	100%
A	80	-	89%
B	70	-	79%
C	60	-	69%
R	Repeat		Less than 60%
X	Incomplete		

UPGRADING OF INCOMPLETES

When a student's course work is incomplete or final grade is below 55%, there is the possibility of upgrading to a pass when a student meets all of the following criteria:

1.   The students attendance has been satisfactory.
2.   An overall average of at least 45% has been achieved.
3.   The student has not had a failing grade in all of the theory tests taken.

4.   The student has made reasonable efforts to participate in class and complete assignments.

The nature of the upgrading requirements will be determined by the instructor and may involve one or more of the following: completion of existing labs and assignments, completion of additional assignments, re-testing on individual parts of the course or a comprehensive test on the entire course.

LABS:

Lab activities represent a very important component of this course. Because of this, **attendance is mandatory** and the satisfactory completion of all lab activities is required. *It is the student's responsibility to discuss absences from regularly scheduled labs with the instructor so that alternate arrangements (where possible) can be made to complete the lab requirements.*

LAB REPORTS

Required lab report requirements will be detailed before labs are assigned.

ATTENDANCE:

Absenteeism will affect a student's ability to succeed in this course. Absences due to medical or other unavoidable circumstances should be discussed with the instructor.

VI.   SPECIAL NOTES:

- **Special Needs**
  Students with special needs (e.g. physical limitations, visual or hearing impairments, or learning disabilities) are encouraged to discuss any required accommodations confidentially with the instructor and/or contact the Special Needs Office so that support services can be arranged.

- **Retention of Course Outlines**
  It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other post-secondary institutions.

- **Course Modifications**
  Your instructor reserves the right to make reasonable modifications to the course as deemed necessary to meet the needs of students or take advantage of new or

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different learning opportunities.

VII.   PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced standing in the course should consult
the instructor. This course is not eligible for challenge at the present time.