

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



Sault College

COURSE OUTLINE

COURSE TITLE: Cisco CCNP Certification I
CODE NO. : CSN308 **SEMESTER:** 5
PROGRAM: Computer Network Technology
AUTHOR: Mark Allemang
DATE: June 2009 **PREVIOUS OUTLINE DATED:** June 2008
APPROVED: "B. Punch"

	CHAIR	DATE
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TOTAL CREDITS: 5
PREREQUISITE(S): CSN310
HOURS/WEEK: 4

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I. COURSE DESCRIPTION:

This course builds on the CCNA curriculum by covering advanced routing concepts and protocols. Instruction includes advanced concepts in networking, network terminology, and routing protocols, including the Border Gateway Protocol (BGP), the Enhanced Interior Gateway Routing Protocol (EIGRP), the multi-area Open Shortest Path First (OSPF) protocol, Multicasting and the Intermediate System-to-Intermediate System (IS-IS) protocol. Topics also include IP Internet Protocol Version 6, hierarchical design principles for building scalable internetworks, advanced routing concepts in building scalable internetworks, and key characteristics for building a secure, responsive, and adaptable internetwork using access control lists (ACLs), route redistribution, and policy-based routing.. Students will install, configure, and operate complex routed LAN and WAN networks.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. Build Scalable IP Internetworks

Potential Elements of the Performance:

- List and describe the layers of the 3 layer hierarchical design model.
- List and describe the characteristics of scalable internetworks
- Select appropriate routing protocols
- Implement advanced routing techniques such as priority queuing, equal & unequal cost load balancing.

This learning outcome will constitute approximately 20% of the course.

Reference: Module 1

2. Utilize Interior routing protocols at an advanced level.

Potential Elements of the Performance:

- Describe various routing processes including default routing, floating static routes, convergence and route calculations.
- Describe EIGRP characteristics such as packet types, various EIGRP tables and route summarization with EIGRP
- Describe the characteristics of multiple area OSPF networks.
- Describe the characteristics of OSPF network types including stub, totally stubby and not so stubby (NSSA) areas.

- Compare IS-IS with other Link State routing protocols.
- Develop a vocabulary for the IS-IS routing protocol and be able to describe terms such as End devices and Intermediate (IS) devices.
- Configure IS-IS routed networks

This learning outcome will constitute approximately 35% of the course.

Reference: Module 2-5

3. Improve network performance through advanced control of interior routing protocols

Potential Elements of the Performance:

- Control routing update traffic
- Implement policy routing
- Control route redistribution
- Complete a routing optimisation challenge lab

This learning outcome will constitute approximately 10% of the course.

Reference: Module 8

4. Describe the characteristics of and configure the BGP Border Gateway Routing Protocol

Potential Elements of the Performance:

- Describe the characteristics of autonomous systems from a Border Gateway Routing Protocol perspective
- Compare and contrast multihomed non transit and multihomed transit autonomous systems.
- Describe and configure the various attributes of BGP for example: next hop, AS_PATH, Multi Exit Discriminator (MED) attribute
- Configure Redundancy symmetry and load balancing in BGP networks
- Complete a BGP challenge lab in preparation for the course practical test

This learning outcome will constitute approximately 15% of the course.

Reference: Module 6

5. Describe Multicasting at the Layer 3 and Layer 2 level and implement multicast networks.

Potential Elements of the Performance:

- Describe multicasting in general
- Utilize IGMP and describe layer 2 multicasting issues
- Describe and select the appropriate Layer 3 Multicasting routing protocol.
- Configure and verify a multicast network.

This learning outcome will constitute approximately 10% of the course.

Reference: Module 7

6. Describe IP Version 6 and implement it in a routed OSPF environment.

Potential Elements of the Performance:

- Explain the addressing format for IPv6
- Compare and contrast ipv6 unicast, multicast and anycast
- Describe and implement IPv6 routing
- Describe the IPv6 transition mechanisms
- Implement IPv6 tunneling through IPv4 networks

This learning outcome will constitute approximately 10% of the course.

Reference: Module 8

III. TOPICS:

1. Scalable Internetworks
2. Routing with IGPs
3. Route optimisation
4. Exterior Gateway Protocols
5. Multicasting
6. IPv6

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

None. All curriculum is online.

V. EVALUATION PROCESS/GRADING SYSTEM:

Theory:

Online Cisco Module exams	30%
Online Final Cisco Exam	25%

Lab:

Practical Test	20%
Lab Activities	25%

Special Note:

Online Cisco exams must be written in class during class time. It is unacceptable to print or otherwise copy any of the online Cisco exams.

The following semester grades will be assigned to students:

Grade	Definition	<i>Grade Point Equivalent</i>
A+	90 – 100%	
A	80 – 89%	4.00
B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 – 59%	1.00
F (Fail)	49% and below	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field /clinical placement or non-graded subject area.	
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.	
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.	
NR	Grade not reported to Registrar's office.	
W	Student has withdrawn from the course without academic penalty.	

VI. SPECIAL NOTES:

Course Outline Amendments:

The professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

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 postsecondary institutions.

Prior Learning Assessment:

Students who wish to apply for advance credit transfer (advanced standing) should obtain an Application for Advance Credit from the program coordinator (or the course coordinator regarding a general education transfer request) or academic assistant. Students will be required to provide an unofficial transcript and course outline related to the course in question. Please refer to the Student Academic Calendar of Events for the deadline date by which application must be made for advance standing.

Credit for prior learning will also be given upon successful completion of a challenge exam or portfolio.

Substitute course information is available in the Registrar's office.

Disability Services:

If you are a student with a disability (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your professor and/or the Disability Services office. Visit Room E1101 or call Extension 2703 so that support services can be arranged for you.

Communication:

The College considers **WebCT/LMS** as the primary channel of communication for each course. Regularly checking this software platform is critical as it will keep you directly connected with faculty and current course information. Success in this course may be directly related to your willingness to take advantage of the **Learning Management System** communication tool.

Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Code of Conduct*. A professor/instructor may assign a sanction as defined below, or make recommendations to the Academic Chair for disposition of the matter. The professor/instructor may (i) issue a verbal reprimand, (ii) make an assignment of a lower grade with explanation, (iii) require additional academic assignments and issue a lower grade upon completion to the maximum grade “C”, (iv) make an automatic assignment of a failing grade, (v) recommend to the Chair dismissal from the course with the assignment of a failing grade. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Student Portal:

The Sault College portal allows you to view all your student information in one place. **mysaultcollege** gives you personalized access to online resources seven days a week from your home or school computer. Single log-in access allows you to see your personal and financial information, timetable, grades, records of achievement, unofficial transcript, and outstanding obligations, in addition to announcements, news, academic calendar of events, class cancellations, your learning management system (LMS), and much more. Go to <https://my.saultcollege.ca>.

Electronic Devices in the Classroom:

Students who wish to use electronic devices in the classroom will seek permission of the faculty member before proceeding to record instruction. With the exception of issues related to accommodations of disability, the decision to approve or refuse the request is the responsibility of the faculty member. Recorded classroom instruction will be used only for personal use and will not be used for any other purpose. Recorded classroom instruction will be destroyed at the end of the course. To ensure this, the student is required to return all copies of recorded material to the faculty member by the last day of class in the semester. Where the use of an electronic device has been approved, the student agrees that materials recorded are for his/her use only, are not for distribution, and are the sole property of the College.

Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session. *It is the departmental policy that once the classroom door has enclosed, the learning process has begun. Late arrivers may not be granted admission to the room.*

Absences due to medical or other unavoidable circumstances should be discussed with the professor. Students are required to be in class on time and attendance will be taken within the first five minutes of class. A missed class will result in a penalty in your marks unless you have discussed your absence with the professor as described above. The penalty depends on course hours and will be applied as follows:

Course Hours	Deduction
5 hrs/week (75 hrs)	1.0% /hr
4 hrs/week (60 hrs)	1.5% /hr
3 hrs/week (45 hrs)	2.0% /hr
2 hrs/week (30 hrs)	3.0% /hr

Absentee reports will be discussed with each student. Final penalties will be reviewed and assessed at the discretion of the professor.

Tuition Default:

Students who have defaulted on the payment of tuition (tuition has not been paid in full, payments were not deferred or payment plan not honoured) as of the first week of *November* will be removed from placement and clinical activities. This may result in loss of mandatory hours or incomplete course work. Sault College will not be responsible for incomplete hours or outcomes that are not achieved or any other academic requirement not met as of the result of tuition default. Students are encouraged to communicate with Financial Services with regard to the status of their tuition prior to this deadline to ensure that their financial status does not interfere with academic progress.