



South Portland, Maine 04106

Computer Information Technology

Title: Routing & Switching Fundamentals

Catalog Number: CMIT 225 T1

Credit Hours: 3

Total Contact Hours: 45

Lecture (or Lab): Lecture & Lab

Instructor: Scott Fortin, CCNA, CCAI

Office Hours – Location: By Appointment

Contact Information: sfortin@smccme.edu

Web Site: https://my.smccme.edu/ICS/Academics/CMIT/CMIT_225/1718_FA-CMIT_225-T1/

Course Syllabus

Course Description

This course focuses on the architecture, components, and operation of routers and switches, and explains the principles of switching, routing and the primary routing protocols. The course will utilize Cisco routing kits for a physical hands on approach reinforcing concepts in preparing students for Cisco CCENT and CCNA exams.

Prerequisite(s) CMIT 100, CMIT 105

Course Objectives

Student will be able to apply switching and routing principles and concepts using Cisco switches and routers. Students will be able to apply the knowledge toward the Cisco CCENT and CCNA exams.

After successfully completing the course, the student will be able to:

1. Describe the functions of switches and routers
2. Configure, maintain, deploy and back up Cisco devices
3. Describe the basics of VLANs and switch-centric protocols
4. Describe the basics of routing tables
5. Describe in detail how router select the best path for packets
6. Apply concepts to build routing tables

Course Objectives / ACM Learning Outcomes

The Association for Computing Machinery (ACM) Committee for Computing Education in Community Colleges (CCECC), at the direction of the ACM Board, convened a task force to produce curricular guidance for associate-degree programs in Information Technology (IT). In fulfilling its charge, the CCECC identified the body of knowledge as a set of fifty student learning outcomes that constitute core IT competencies for all IT-related associate degree programs. The full list of student outcomes is available for download at [http:// www.acmcecc.org/](http://www.acmcecc.org/).

An ability to demonstrate core IT competency in networking and convergence

22. Carry out basic computer network troubleshooting techniques.

23. Describe the layers, protocols and components of the OSI model.
24. Diagram the components of an integrated IT system.
25. Differentiate among various computer networking models.
26. Differentiate among various techniques for making a computer network secure.
27. Summarize the flow of data through a computer network scenario.

An ability to function effectively as a member of a diverse team to accomplish common goals

42. Use communication, negotiation, and collaboration skills as a member of a diverse team.

An ability to read and interpret technical information, as well as listen effectively to, communicate orally with, and write clearly for a wide range of audiences

43. Describe the attitudes, knowledge and abilities associated with quality customer service.
44. Produce technical documentation responsive to an identified computing scenario.
45. Use documentation or a knowledge base to resolve a technical challenge in an identified computing scenario.

Weekly Learning Objectives:

Week #	Dates	Cisco Chapter / Topic	Tentative Assignments
1	8/29 – 9/4	Introduction	Syllabus Review Cisco NetAcad Account Setup MySMCC page demo Home Router IP info worksheet
2	9/5 – 9/11	OSI Model Review Subnetting Review	Install & submit Packet Tracer file Access CSEC VPN, VDirector, Packet Tracer on student VM Pretest Exam
3	9/12 – 9/18	Chapter 1: Routing Concepts	Chapter 1 Reading/ E Learning on Netacad Chapter 1 Presentation - Chapter 1 Labs: 1.1.3.5, 1.1.4.5, 1.3.2.5 Chapter 1 Exam
4	9/19 – 9/25	Chapter 2: Static Routing	Chapter 2 Reading / E Learning on Netacad Chapter 2 Presentation - Chapter 2 Labs: 2.2.2.4, 2.3.2.3 Chapter 2 Exam
5	9/26 – 10/2	Chapter 3: Routing Dynamically	Chapter 3 Reading / E Learning on Netacad Chapter 3 Presentation - Chapter 3 Labs: 3.2.1.8 Chapter 3 Exam Task 1: 3.2.1.9 (on hardware)
6	10/3 – 10/9	Chapter 4: Switched Networks	Chapter 4 Reading / E Learning on Netacad Chapter 4 Presentation - Chapter 4 Labs: Chapter 4 Exam
7	10/10 – 10/16	Chapter 5: Switch Configuration	Chapter 5 Reading/ E Learning on Netacad Chapter 5 Presentation - Chapter 5 Labs: 5.2.1.4, 5.2.2.7 Chapter 5 Exam
8	10/17 – 10/23	Chapter 6: VLANs (part 1)	Chapter 6 Reading / E Learning on Netacad Chapter 6 Presentation – Chapter 6 Labs: 6.1.1.5, 6.2.1.7, 6.2.2.4
9	10/24 – 10/30	Chapter 6: VLANs (part 2)	Chapter 6 Reading / E Learning on Netacad Chapter 6 Labs: 6.2.3.7, 6.3.3.6 Chapter 6 Exam Task 2: 6.4.1.2
10	10/31 – 11/6	Chapter 7: Access Control Lists	Chapter 7 Reading / E Learning on Netacad Chapter 7 Presentation – Chapter 7 Labs: 7.2.1.6, 7.2.1.7, 7.2.3.3 Chapter 7 Exam
11	11/7 – 11/13	Chapter 8: DHCP	Chapter 8 Reading / E Learning on Netacad Chapter 8 Presentation –

			Chapter 8 Labs: 8.1.3.3, 8.3.1.2 Chapter 1 Exam
12	11/14 – 11/20	Thanksgiving Break	IPv6 Essay due on 11/21
13	11/21 – 11/27	Chapter 9: NAT for IPv4	Chapter 9 Reading / E Learning on Netacad Chapter 9 Presentation – Chapter 9 Labs: 9.2.1.4, 9.2.2.5, 9.2.3.6, 9.2.4.4 Chapter 9 Exam
14	11/28 – 12/4	Chapter 10: Device Discovery, Management, and Maintenance	Chapter 10 Reading / E Learning on Netacad Chapter 10 Presentation – Chapter 10 Labs: 10.1.1.4, 10.2.3.5, 10.3.1.8, 10.3.3.5 Chapter 10 Exam
14	12/5 – 12/11	Task 4 & Review	Task 4 intro, Jeopardy 1 / Jeopardy 2
15	12/12 – 12/16	Final Exam	Given 12/12 @ 6:00 pm. Task 4 due 12/16 @ 11:59pm

Student Evaluation and Grading

A	93 - 100	C+	77 - 79
A-	90 - 92	C	73 - 76
B+	87 - 89	C-	70 - 72
B	83 - 86	D+	67 - 69
B-	80 - 82	D	63 – 66
		F	62.999

Attendance	10%
Labs	25%
Chapter Exams	20%
Tasks	20%
Presentation	10%
Final Exam	15%

Attendance is required weekly. Attendance is an easy 10% on your final grade. This grade will be the number of classes attended / total number of classes held. This is separate from the college's attendance policy listed below.

Labs are a combination of a Packet Tracer simulation & answers to the lab guide. One or the other or both may be assigned for each lab. Labs may be completed in the VDirector environment or on a locally installed version of Packet Tracer. Typed lab question answers should be completed in a word processor and uploaded to MySMCC. All major formats are accepted. Completed labs must be turned in by start of class on Tuesday to MySMCC.

Students may **optionally** complete additional on-hardware labs that are presented throughout the course material. On-hardware labs must be scheduled with the instructor to allow access to Cisco learning pods in the CMIT learning area. These labs are good practice for CCENT or CCNA certification exams.

Chapter exams are given through the Cisco Networking Academy learning management system. We typically complete 1 chapter per week and the exam for the chapter must be completed by the start of the new chapter, usually Tuesdays at 6:00pm. Use your Cisco NetAcad account credentials at

<http://www.netacad.com> with a supported browser to take the exam. SMCC Library, Tech 103, and Campus Center student lounge spaces have computers that are available for use 7 days a week (for “computer died” scenarios).

Tasks are given 4 times during the semester. Tasks are Packet Tracer labs without the step-by-step instructions to get you through. Use your notes, online documentation, and each other to get your way to 100%! Tasks are due during the week assigned by start of class on Tuesday. The 3rd task grade is an essay on IPv6 and the changing roles of routers, switches, and services (DHCP, NAT)– more info will be made available on the course page.

The chapter **presentation**. Each student in the class will pick a chapter of the book by choice or at random during the first week of class. The student will become the ‘subject matter expert’ for the chapter and will present during the week the chapter is assigned. The presentation should be a lecture or interactive demo of the concepts presented in the book / web material. The presenter should use a visual display or whiteboarding and be able to respond to classmate and instructor questions. The presentation will be graded by rubric available on MySMCC. 10 bonus points are given for being the first to present!

The Final Exam will be given via Cisco Network Academy. The exam will be 50 questions + and will be comprehensive – covering all 10 chapters of the Cisco Networking Academy: CCNA Routing & Switching, Routing and Switching Essentials module. The best way to study for this exam is to review your old chapter exams which will be opened for review a few weeks prior to the semesters’ end. Final Exam bonus points may be earned by writing. The exam will be proctored in-class on Tuesday, 12/12.

Text, Tools and / or Supplies

All learning material for the course is delivered through the Cisco Network Academy web portal. For those students who prefer a hard copy of the text they may purchase the above book from the site of their choosing.

Optional:

Routing and Switching Essentials Companion Guide v6
Cisco Networking Academy
ISBN-10: 1-58713-318-0
ISBN-13: 978-1-58713-318-3

End-of-Course Evaluation

Students complete evaluations for each course attended at SMCC. Evaluations are submitted online and can be accessed through the student portal. Students can access the course evaluations beginning one week before the end of classes. The deadline for submission of evaluations occurs Monday at 5 PM following the last day of the class. You will receive an email to your student email account when course evaluations are available.

Attendance Policy

Regular and prompt attendance will contribute to your success in this class. Missing 3 consecutive classes will result in being recorded as AF **Administrative Failure**. 5 or more unexcused absences may result in academic failure. If you come in after the start of the class you may be marked as absent. Part of your grade is based on your attendance. You are scored on the proportion of the classes you attend. If you make 32/32 classes you will receive a 100% for attendance, 30/32 would be 93.75%, etc. Please let your instructor know if you will be late or will not attend class – they will use their best judgment if your tardiness or absence will be excused.

ADA Syllabus Statement

Southern Maine Community College is an equal opportunity/affirmative action institution and employer. For more information, please call 207-741-5798. If you have a disabling condition and wish to request accommodations in order to have reasonable access to the programs and services offered by SMCC, you must register with the Disability Services Coordinator, Sandra Lynham, who can be reached at 741-5923. Further information about services for students with disabilities and the accommodation process is available upon request at this number. Course policies about online testing are modified to suit each individual's accommodations.

SMCC Pay-for-Print Policy

Per Page Costs

Each semester students receive a \$20 printing credit. The balance resets at the end of the semester and any remaining credits are removed. The cost varies depending upon page size and whether printing is done in black and white or color.

- a. There is a \$0.10 per page fee for standard 8.5" by 11" black and white documents.
- b. The reverse sides of duplex (double-sided) documents are free.
- c. There is a \$.50 per page fee for standard 8.5" by 11" color documents.
- d. There is a \$.20 per page fee for 8.5" by 14" (legal) or 11" by 17" (tabloid) black and white documents.
- e. There is a \$1.00 per page fee for 8.5" by 14" (legal) or 11" by 17" (tabloid) color documents.

Duplex charges (printing on both sides of a page) work in the following fashion: One page is \$0.10, two pages are \$0.10, three pages are \$0.20, and four pages are \$0.20, etc. The flipsides are free, but another sheet of paper is \$0.10. Please be aware that a document with any color at all (when printed to a color printer) will by default be printed in color. You are responsible for setting the print job to print black and white if you do not need color. For directions, please go to the IT Help tab in My SMCC.

How does it work?

The College's pay-for-print system monitors printing on all printers (including those in general access labs, library printers, the Academic Achievement Center, Noisy Lounge and technology labs). Students can check the number of pages they have printed by using the Printing Balance tool available on SMCC computers (located in the lower right corner of the screen, near the clock). Departments with work study students who need to print documents for the department should contact the Help Desk at 741-5696 to have a special account set up.

Refunds

Print jobs are eligible for a refund in the event of mechanical or electronic error on the part of the printer, print server, or software used to submit the job. Jobs are not eligible for a refund in cases where the job was not set up correctly, was submitted multiple times, or the student is not satisfied with the result. To request a refund, please bring the offending print to the IT Department in the basement of the Ross Technology Center. Refunds will be granted in the form of a credit to the student's account.

Why is SMCC charging for printing?

The pay-for-print system is an effort to control escalating printing costs. Charging for printing helps offset the increasing cost of supplies and encourages students to conserve resources. To find ways to reduce your printing charges, please go to the IT Help tab on My SMCC. If you have questions about the pay-for-printing policy or your printing charges, please contact the Help Desk at 741-5696 or send an email to helpdesk@smccme.edu.

Be sure to log OUT of the system when you've finished your printing, to prevent unauthorized access to your account.

Add-Drop Policy

Students who drop a course during the one-week "add/drop" period in the fall and spring semesters and the first three days of summer sessions receive a 100% refund of the tuition and associated fees for that

course. Please note any course that meets for less than the traditional semester length, i.e., 15 weeks, has a pro-rated add/drop period. There is no refund for non-attendance.

Withdrawal Policy

A student may withdraw from a course only during the semester in which s/he is registered for that course. The withdrawal period is the second through twelfth week of the fall and spring semesters and the second through ninth week of twelve-week summer courses. This period is pro-rated for shorter-length courses. To withdraw from a course, a student must complete and submit the appropriate course withdrawal form, available at the Enrollment Service Center (no phone calls, please). The designation "W" will appear on the transcript after a student has officially withdrawn. A course withdrawal is an uncompleted course and may adversely affect financial aid eligibility. Failure to attend or ceasing to attend class does not constitute withdrawal from the course. There is no refund associated with a withdrawal.

Plagiarism Statement

Adherence to ethical academic standards is obligatory. Cheating is a serious offense, whether it consists of taking credit for work done by another person or doing work for which another person will receive credit. Taking and using the ideas or writings of another person without clearly and fully crediting the source is plagiarism and violates the academic code as well as the Student Code of Conduct. If it is suspected that a student in any course in which s/he is enrolled has knowingly committed such a violation, the faculty member should refer the matter to the College's Disciplinary Officer and appropriate action will be taken under the Student Code of Conduct. Sanctions may include suspension from the course and a failing grade in the course. Students have the right to appeal these actions to the Disciplinary Committee under the terms outlined in the Student Code of Conduct.