NTM 2415 – Cisco TCP/IP Routing Protocols & Router Configuration
Cisco Networking Academy – Cisco Semesters 1 & 2
Online

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Course Description: This curriculum provides students with the skills needed to succeed in networking-related degree programs and helps then prepare for CCNA and CCENT certifications. It also helps students develop the skills necessary to fulfill the job responsibilities of network technicians, network administrators, and network engineers. It provides a theoretically-rich, hands-on introduction to networking and the Internet.

Learning Outcomes:

Students who complete Network Fundamentals (1st half of semester) will be able to perform the following tasks:

1. Explain the importance of data networks and the Internet in supporting business communications and everyday activities
2. Explain how communication works in data networks and the Internet
3. Recognize the devices and services that are used to support communications across an Internetwork
4. Use network protocol models to explain the layers of communications in data networks
5. Explain the role of protocols in data networks
6. Describe the importance of addressing and naming schemes at various layers of data networks
7. Describe the protocols and services provided by the application layer in the OSI and TCP/IP models and describe how this layer operates in various networks
8. Analyze the operations and features of transport layer protocols and services
9. Analyze the operations and feature of network layer protocols and services and explain the fundamental concepts of routing
10. Design, calculate, and apply subnet masks and addresses to fulfill given requirements
11. Describe the operation of protocols at the OSI data link layer and explain how they support communications
12. Explain the role of physical layer protocols and services in supporting communications across data networks
13. Explain fundamental Ethernet concepts such as media, services, and operation
14. Employ basic cabling and network designs to connect devices in accordance with stated objectives
15. Build a simple Ethernet network using routers and switches

16. Use Cisco command-line interface (CLI) commands to perform basic router and switch configuration and verification
17. Analyze the operations and features of common application layer protocols such as HTTP, Domain Name System (DNS), Dynamic Host Configuration Protocol (DHCP), Simple Mail Transfer Protocol (SMTP), Telnet, and FTP
18. Utilize common network utilities to verify small network operations and analyze data traffic

Students who complete Routing Protocols and Concepts (2nd half of semester) will be able to perform the following functions:

1. Describe the purpose, nature, and operations of a router
2. Explain the critical role routers play in enabling communications across multiple networks
3. Describe the purpose and nature of routing tables
4. Describe how a router determines a path and switches packets
5. Explain the route lookup process and determine the path packets will take in a network
6. Configure and verify basic operations for a newly-installed router
7. Describe the purpose of static routes and the procedure for configuring them
8. Configure and verify static and default routing
9. Describe the role of dynamic routing protocols and place these protocols in the context of modern network design
10. Describe how metrics are used by routing protocols and identify the metric types used by dynamic routing protocols
11. Identify the characteristics of distance vector routing protocols
12. Describe the network discovery process of distance vector routing protocols using Routing Information Protocol (RIP)
13. Describe the functions, characteristics, and operations of the RIPv1 protocol
14. Compare and contrast classful and classless IP addressing
15. Describe classful and classless routing behaviors in routed networks
16. Design and implement a classless IP addressing scheme for a given network
17. Describe the main features and operations of the Enhanced Interior Gateway Routing Protocol (EIGRP)
18. Use advanced configuration commands with routers implementing EIGRP and OSPF
19. Describe the basic features and concepts of link-state routing protocols
20. Describe the purpose, nature, and operations of the Open Shortest Path First (OSPF) Protocol
21. Configure and verify basic RIPv1, RIPv2, single area OSPF, and EIGRP operations in a small routed network
22. Use router **show** and **debug** commands to troubleshoot common errors that occur in small routed networks

Texts:
First half of the semester:
Introduction to Networks Companion Guide, Cisco Press, ISBN: 9781587133169, eBook: 9780133475449.

Second half of semester:
Routing and Switching Essentials Companion Guide, Cisco Press, ISBN: 9781587133183, eBook: 9780133476224.

Curriculum is changing so books may not be available; rely on the online curriculum for now.
http://ptgmedia.pearsoncmg.com/imprint_downloads/cisco/irc/CourseBookSchedule_May2013.pdf

Recommended Reading:

Wendell Odom - CCNA ICND1 Official Exam Certification Guide, 2nd Edition
http://www.amazon.com/CCENT-ICND1-Official-Certification-Guide/dp/1587201828/ref=sr_1_3?ie=UTF8&s=books&qid=1299178454&sr=1-3.

This is NOT an official Network Academy text book so does not follow chapter for chapter, but Odem's ability to explain difficult concepts in lay terms will enhance the topics being covered each week.

Strategy:

There is a lot of reading, as well as many (at least one per chapter) virtual lab to be completed each week (sometimes more than one) and since it is an online course it will become very apparent that you must stay on schedule as laid out below. The mid-term exam will cover the first half of the semester as per this syllabus and that is all we will do that night, and the final will cover the last of the semester it is comprehensive covering only the material since the mid-term.

Week of:	Topic
Aug 24	Chapter 1 – Exploring the Network
	Chapter 2 – Configuring a Network OS
Sept 1	Chapter 3 – Network Protocols and Communications
	Chapter 4 – Network Access
Sept 7	Chapter 5 – Ethernet
	Chapter 6 – Network Layer
Sept 14	Chapter 7 – Transport Layer
	Chapter 8 – IP Addressing
Sept 21	Chapter 9 – Subnetting IP Networks
	Chapter 10 – Application Layer
Sept 28	Chapter 11 – It's a Network
Oct 5	Mid-Term Exam (Semester 1 Final) Exact date TBD
Oct 12	Chapter 1 – Introduction to Switched Networks
	Chapter 2 – Basic Switching Concepts and Configuration

Oct 19   Chapter 3 - VLANs
                                      Chapter 4 – Routing Concepts

Oct 26   Chapter 5 – Inter-VLAN Routing

Nov 2   Chapter 6 – Static Routing

Nov 9   Chapter 7 – Routing Dynamically
                                      Chapter 8 – Single-Area OSPF

Nov 16   Chapter 9 – Access Control Lists

Nov 23   Chapter 10 – DHCP

Dec 1   Chapter 11 – Network Address Translation for IPv4

Dec 7   Finals Week   (Semester 2 Final)

These Packet Tracer activities will be emailed to this address each week AJ is my lab assistant and your SI most questions concerning the labs and day to day operation should be directed to him. If for some reason you don't get the help you need then please come to me. AJ will develop his own requirements for PacketTracer assignment turn in's but I'm certain they will need to be into him the week they are do. There is a massive about of work to do in this class, you CANNOT blow this class off until the end and expect to pass. Not to depress you but I fail more people in these two Cisco classes than all my other classes combined. It's not that the material is so difficult, it's just that there is so much and we travel fast. You can see my the schedule that we cover two chapters and week normally. That's two tests and two PTs ever week. And it's online so you have to be self motivated. Depressed you yet? Sorry…

PacketTracer files that are required to turn in to AJ are as follows: All the labs are accessed from imbedded links in the curriculum. There are many more PT activities that I encourage you to do but do NOT want them turn in. Only the one's on this list will be graded. There will be a face to face class to assist you with PT if necessary at a time yet to be determined.

1st half	2nd half
1.2.4.4	1.3.1.3
2.3.2.5	2.2.1.4
3.3.3.3	3.4.1.2
4.2.4.5	4.1.3.5
5.3.3.5	5.1.3.6
6.4.3.3	6.2.2.4
7.3.1.2	7.3.1.8
8.3.2.5	8.2.2.7
9.1.4.6	9.4.2.8

10.2.2.8   10.1.3.3
11.4.2.5   11.2.2.5
Final Lab

Grading: You will be able to track you progress via the grade book on the Cisco Academy web site.

Change in grading:

Mid-Term exam	20%
Final Exam	20%
Quizzes	20%
Packet Tracer's	20%
Final Lab	20%