

Course Syllabus

Important Information: Although this is listed and done as an online class, it is NOT an official WSU online class. It is through Canvas but not WSU's Canvas so it doesn't connect to grades and other things the same way. Also you don't access it through WSU Online but through <https://cisco.netacad.com/group/landing/>. You will also receive your login information in your Wildcat email address.

Sorry for the confusion.

Ken

NTM 2415 – Cisco TCP/IP Routing Protocols & Router Configuration
Cisco Networking Academy – Cisco Semesters 1 & 2
Online
Spring 2015

Instructor: Ken Cuddeback
Phone: Office: (801) 589-5082 – **personal cell phone so only use in emergency**
Email: kcuddeback@weber.edu - best way to get me

Course Description:

This curriculum provides students with the skills needed to succeed in networking-related degree programs and helps them 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 (1/2 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 (2- 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 changes so rapidly that books are always out of date so rely on the online curriculum.

Recommended Reading:

Wendell Odom - <http://www.ciscopress.com/store/ccent-ccna-icnd1-100-101-official-cert-guide-9781587143854>

This is NOT an official Network Academy textbook so does not follow chapter for chapter, but Odom'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 (at least one per chapter) virtual labs to be completed each week (and we usually cover two chapters per week) 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 the final will cover the last half of the semester. The Packet Tracer virtual labs have firm due dates, points will be take off for all late work.

Packet Tracer:

You will need to log into the course at [Cisco's web site](#) to access the course (the reading) and the Packet Tracer activities, go to the bottom of the first page after you log in and click on Educational Resources and the link for Packet Tracer on the Left column. You also need to download and install the program or the activities won't work. There is now an Apple iOS version of the program as well as an Android version both of these are for mobile devices and will work but the PC version is always easier. Unfortunately there is not a Mac version of the program.

Time Line:

<u>Week of:</u>	<u>Topic</u>
Aug 30	Chapter 1 – Exploring the Network Chapter 2 – Configuring a Network OS
Sep 6	Chapter 3 – Network Protocols and Communications Chapter 4 – Network Access
Sep 13	Chapter 5 – Ethernet Chapter 6 – Network Layer
Sep 20	Chapter 7 – IP Addressing Chapter 8 – Subnetting IP Networks
Sep 27	Chapter 9 – Transport Layer Chapter 10 – Application Layer
Oct 4	Chapter 11 – Build a Small Network
Oct 11	Mid-Term Exam in classroom on (Semester 1 Final) or make arrangements!
Oct 18	Chapter 1 – Introduction to Switched Networks Chapter 2 – Basic Switching Concepts and Configuration
Oct 25	Chapter 3 – VLANs Chapter 4 – Routing Concepts
Nov 1	Chapter 5 – Inter-VLAN Routing Chapter 6 – Static Routing
Nov 8	Chapter 7 – Routing Dynamically
Nov 15	Chapter 8 – Single-Area OSPF
Nov 22	Chapter 9 – Access Control Lists
Nov 29	Chapter 10 – DHCP
Dec 6	Chapter 11 – Network Address Translation for IPv4
Dec 13	Finals week!

Finals day/time – April 30, 10am in classroom (Semester 2 Final)

These Packet Tracer activities will be submitted through **WSU's Canvas not Cisco's Canvas**, there's no place to submit in Cisco's Canvas so you can't do it wrong. There is a massive amount of work to do in this class, 22 Chapter quizzes, 22 Packet Tracers and for me 22X24=528 PT's I have to grade and enter into the grade book (no way to automate it). 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 of it and we move fast. You can see by 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 yet? Sorry...and to make it worse these are required classes to graduate. You can do it, just set up a schedule and stick to it.

These are the Packet Tracer Labs to be handed in to me through Canvas. No other PTs will be accepted there are sometimes three or four in each chapter, due as many as you can but only turn in these listed. Notice that there are due date associated with each one. Also notice these assignments are on [WSUs Canvas](#) page NOT on Cisco's page.

<u>1- half</u>	<u>2- half</u>
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. Except for PT activities will be tracked on WSU's Canvas grade book.

Assignments	20%
Midterm Exam	20%
Midterm PT	20%
Final Exam	20%
Final PT	20%
Total	100%