Networking Technology: CCNP ROUTE - CNVT 2010 - 001; Fall 2022

Instructor	Tony Rashid	
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Office Hours	Room 2188, Tuesdays & Thursdays 4:00 - 5:00 P.M	
Class Section	Section: 104 - CRN: 37124. Starting date August 31 - end date December 20	
	The class meets on Tuesdays and Thursdays 12:00 - 3:50 P.M	

Instructional Material

Cisco Academy Assessment Web Site: <u>https://www.netacad.com/</u>			
Text Books	CCNP Enterprise Advanced Routing and Services		
	ENARSI 300-410		
	ISBN-10: 1-58714-525-1		
	ISBN-13: 978-1-58714-525-4		
	By Raymond Lacoste and Brad Edgeworth, Cisco Press - Link to book <u>Cisco Press</u>		

Grading Policies

Skills:	
Labs and Class Participation	25%
Packet Tracer Activities	5%
Practical Final	30%
Academic:	
	15%
Group Chapter Exams	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Final	25%

NOTE: Student will be given a final grade only when all requirements have been completed

		93-100%	А	90-92%	A-
87-89%	B+	83-86%	В	80-82%	B-
77-79%	C+	70-76%	С		
67-69%	D+	60-66%	D		
		Below 60%	F		

Examinations:

All exams are to be taken online at the assigned time. Taking all chapter exams, working on Labs and Packet Tracer assignments will prepare you for the final and practical exams. You cannot utilize any materials such as books, notes, cell phones or the Internet searches when taking these exams. Students are reminded of the college policies relative to working independently and are required to complete all examinations, Packet Tracer labs and other materials assigned. These requirements can be done either independently, or in a group, depending on the instructions given.

Students are expected to **uphold a standard of conduct** relating to academic honesty. Students assume full responsibility for the content and integrity of the academic work they submit. Cheating and plagiarism will not be tolerated. Copying answers on tests from somebody else, as well as assignments (entire or partial) is not allowed. Copying from textbooks and/or the Internet is also not allowed. Students who plagiarize and those who allow somebody else to copy your work will receive a grade of 0 (zero) for that exam or assignment.

Attendance/Tardiness:

Your final grade may be dropped by one letter grade as a result of missing the equivalent of two weeks of classes. An excused absence is: personal illness; urgent family issue; work related or a transportation issue. It is the responsibility of the student to notify the instructor of any absence and the reason for it. Documentation for the absence should be provided where applicable. Students whose work schedule may cause occasional tardiness should let the instructor know of the situation as soon as possible and are responsible for ALL missed work.

Other Policies

- Use of Cell Phones (IM, tweet, email, etc.) is not permitted in class, devices must be turned off or in silent mode during exams and lectures. No "Browsing/Surfing" PC's or laptops during examinations and lectures other than the allowed instructional sites.
- The student expected to read/complete lessons outside of class time.

- Late assignments, including labs, will be penalized 10%.
- All assignments must be completed using word processor or other appropriate applications.
- Students who miss a chapter exam must take the exam within two classes of the original exam date.
- Students are responsible to see the instructor about making-up any work missed due to absence.
- Students are expected to participate as a member of teams when required.
- Students must pass both the Skills based portion in addition to the Academic portion of the curriculum to pass the course.
- Student's final grade can only raise one letter grade above the on-line final exam score based on other class assignments.
- Students are allowed a **maximum** of one (1) re-takes of chapter group exam per the semester. the re-take must be completed in the classroom **prior** to the final exam, **without exception**.

Classroom Etiquette, Netiquette Policy:

- Respect your classmates and their opinions, knowledge and presence.
- Speak articulately and use proper grammar. Be respectful of your classmates and instructor.
- Do not include personal topics, or experiences, unless they are related to the topic being discussed.
- DO NOT use capitals, it is a known policy that by doing so you are representing "anger" which will not be tolerated.
- Agree to disagree. Do not ensue in an argument, but instead understand that there will be differences of opinions, which should be discussed.
- Don't share another's information, this is an invasion of privacy and can be considered a form of plagiarism. Ask for permission before posting anything that is not your own property, idea or work.
- Do not post anything that can be misconstrued as "inappropriate", this could lead to severe actions, and possible dismissal.
- If something is offensive to you, please do not take matters into your own hands, reach out to your instructor for guidance.
- Always reread your information before sending to ensure that it is in an acceptable form of communication.
- Please refer to <u>The Student Handbook Code of Conduct outlines what is misconduct by a student.</u>

Accessibility Policy:

CCRI is committed to creating an environment that meets the needs of all students. CCRI abides by the Americans with Disabilities Ace and Sections 504 and 508 of the Rehabilitation Act of 1973. Any student having a disability can arrange accommodations. Please refer to the <u>Disability Services for Students</u> for assistance.

Advanced Routing: CNVT 2010

Cisco Certified Network Professional (CCNP) Enterprise Advanced Routing: provides students with an in-depth knowledge to support the implementation and troubleshooting of advanced routing technologies and services including layer 3 Virtual Private Network (VPN) services, infrastructure security and infrastructure services used in enterprise networks

As a result of this course, a student will be able to:

- Implement and troubleshoot advanced Enhanced Interior Gateway Routing Protocol (EIGRP) features for IPv4 and IPv6 in a small to medium-sized business network
- Implement and troubleshoot multiarea Open Shortest Path First (OSPF) v2 and v3 to enable internetwork communications
- Configure and troubleshoot Border Gateway Protocol (BGP) with advanced features, explain the processes used by BGP for path selection
- Troubleshoot and modify Route Maps, conditional forwarding issues, and route redistribution between routing protocols
- Explain the impact of Variable Frame Rate (VFR) and Multi-Protocol Label Switching (MPLS) on routing decision
- Configure Dynamic Multipoint Virtual Private Network (DMVPN) and Internet Protocol Security (IPsec) DMVPN with Pre-Shared Authentication

Networking Technology: CCNP ROUTE - CSCO 2010-104; Spring 2019

	Less	Subjects	Assignments:
9/1	on	Chapter 1 - IPv4/IPv6 Addressing and Routing Implement DHCP to operate across multiple LANs. Troubleshoot a DHCP configuration for IPv4 in a switched network. Troubleshoot a DHCP configuration for IPv6 in a switched network. Troubleshoot the packet forwarding process. Troubleshoot common problems associated with IP addressing and host configurations. Troubleshoot common static and default route configuration issues.	Labs and Packet Tracer Activities 1.1.2 Lab - Troubleshoot IPv4 and IPv6 Addressing Issues 1.1.3 Lab - Troubleshoot IPv4 and IPv6 Static Routing Labs due by 9/1/2022
9/6		Chapter 2 - EIGRP Implement EIGRP for IPv4 in a small to medium-sized business network. Describe the basic features of EIGRP. Configure EIGRP for IPv4 in a small routed network. Explain the metrics used by EIGRP.	 2.1.2 Lab - Implement EIGRP for IPv4 Due by 9/6/2022
9/8		Chapter 3 - Advanced EIGRP Explain how EIGRP forms neighbor relationships. Configure EIGRP manual summarization. Explain how WAN considerations affect network performance. Explain how route manipulation affects network performance.	3.1.2 Lab - Implement Advanced EIGRP for IPv4 Features. Due by 9/8/2022
9/13		Chapter 4 - Troubleshooting EIGRP for IPv4 Troubleshoot neighbor adjacency issues in an EIGRP network. Troubleshoot missing route entries in an EIGRP routing table. Troubleshoot miscellaneous IPv4 FIGRP issues	 4.1.2 Lab - Troubleshoot EIGRP for IPv4 Due by 9/13/2022 4.2.1 Packet Tracer - Troubleshoot EIGRP for IPv4 Due by 9/4/2022
9/15		Chapter 5 - EIGRPvó Troubleshoot RIGRPvó Issues: Explain the features and characteristics of EIGRPv6. Troubleshoot EIGRPv6 neighbor issues. Troubleshoot EIGRPv6 route issues. Troubleshoot named EIGRP.	 5.1.2 Lab - Implement EIGRP for IPv6 5.1.3 Lab - Troubleshoot EIGRP for IPv6 5.2.1 Packet Tracer - Configure Basic EIGRP with IPv6 Routing Due by 9/15/2022 5.2.2 Packet Tracer - Troubleshoot EIGRP for IPv6. Due by 9/18/2022 5.2.3 Packet Tracer - Implement EIGRP for IPv4 and IPv6. Due by 9/18/2022
Chapte	er Grou	p Exam - Routing Concepts and EIGRP Due by midr	night 9/19/2022
9/20		Chapter 6 - OSPF Explain the features and characteristics of the OSPF routing protocol. Configure multiarea OSPFv2 in a routed network. Explain how OSPF works in BMA networks. Compare OSPF network types. Explain how the OSPF hello and dead timer intervals affect communication. Configure OSPF authentication to ensure secure routing updates.	6.1.2 Lab - Implement Single-Area OSPFv2 Due by 9/20/2022 6.2.1 Packet Tracer - Implement Multiarea OSPFv2 Due by 9/21/2022

9/22 9/27	Chapter 7 - Advanced OSPF Implement multiarea OSPF for IPv4 to enable internetwork communications: Explain how multiarea OSPFv2 uses link state advertisements. Explain the function of stubby areas in OSPF. Explain how OSPF selects the best path. Configure summarization between OSPF areas. Explain how to connect discontiguous areas in OSPFv2	 7.1.2 Lab - Implement Multi-Area OSPFv2 7.1.3 Lab - OSPFv2 Route Summarization and Filtering Labs due date 9/27/2022
9/29	Chapter 8 - Troubleshooting OSPFv2 Troubleshoot connectivity issues in OSPFv2: Troubleshoot OSPFv2 neighbor adjacencies. Troubleshoot OSPFv2 routes. Troubleshoot miscellaneous OSPFv2 issues.	8.1.2 Lab - Troubleshoot OSPFv2 Due by 9/29/2022 8.2.1 Packet Tracer - Troubleshoot Multiarea OSPFv2. Due by 10/3/2022
10/4	Chapter 9 - OSPFv3 Implement multiarea OSPFv3: Compare the characteristics and operations of OSPFv2 to OSPFv3. Configure multiarea OSPFv3. Compare the impact of OSPFv2 and OSPFv3 LSAs.	9.1.2 Lab - Implement Multiarea OSPFv3 Due by 10/4/2022 9.2.1 Packet Tracer - Configure Multiarea OSPFv3 Due by 10/10/2022
10/6	Chapter 10 - Troubleshooting OSPFv3 Troubleshoot issues with OSPFv3 implementation: Explain the use of the commands used to troubleshoot OSPFv3 issues. Troubleshoot OSPFv3 address family issues.	10.1.2 Lab - Troubleshoot OSPFv3 Due by 10/6/2022 10.2.1 Packet Tracer - Troubleshoot Multigreg OSPEv3 Due by 10/10/2022
Chapter Gro	up Exam - OSPF Due 10/10/2022	
10/11	Chapter 11 – BGP Configure BGP: Describe basic BGP features. Configure BGP to establish neighbor sessions. Compare BGP session types. Configure multiprotocol BGP for IPv6.	 11.1.2 Lab - Implement eBGP for IPv4 11.1.3 Lab - Implement MP-BGP Labs due by 10/11/2022
10/13	Chapter 12 - Advanced BGP Configure BGP with advanced features: Configure summarization in BGP to improve performance. Explain how BGP uses route filtering and manipulation to improve performance. Explain the function and purpose of BGP communities. Explain how to control the size of the BGP table.	12.1.2 Lab - Implement BGP Path Manipulation. Due by 10/13/2022
10/18	Chapter 13 - BGP Path Selection Explain the processes used by BGP for path selection: Explain the processes used by BGP for path selection. Explain how BGP attributes affect path selection. Explain how equal cost multipathing provides load balancing for BGP.	13.1.2 Lab - Implement BGP Communities Due date 10/18/2022
10/20 Chapter Gra	Chapter 14 - Troubleshooting BGP Troubleshoot BGP issues: Troubleshoot issues with BGP neighbor adjacencies. Troubleshoot BGP routes. Troubleshoot issues with BGP path selection. Troubleshoot miscellaneous BGP issues. Dup Exam - BGP Due 10/24/2022	14.1.2 Lab - Troubleshooting BGP Due date 10/20/2022

10/25	Chapter 15 - Route Maps and Conditional Forwarding Troubleshoot Route Maps and conditional forwarding issues: Configure ACLs and prefix lists. Explain the purpose of route maps. Configure Policy-based Routing (PBR). Troubleshoot conditional forwarding issues.	 15.1.2 Lab - Control Routing Updates 15.1.3 Lab - Path Control Using PBR 15.1.4 Lab - Troubleshoot Route Maps and PBR
10/27	Chapter 16 - Route Redistribution Configure route redistribution between routing protocols: Explain route redistribution. Configure route redistribution between routing protocols.	 16.1.2 Lab - Configure Route Redistribution Between EIGRP and OSPF 16.1.3 Lab - Configure Route Redistribution Within the Same Interior Gateway Protocol 16.1.4 Lab - Configure Route Redistribution Using BGP
11/1	Chapter 17 - Troubleshooting Redistribution Troubleshoot IPv4 and IPv6 route redistribution: Troubleshoot advanced redistribution issues. Troubleshoot IPv4 and IPv6 route redistribution. Troubleshoot miscellaneous route redistribution issues.	17.1.2 Lab - Troubleshoot Redistribution
11/3	Review	Labs due date 11/3/2022
Chapter Gr	oup Exam – Conditional Forwarding and Route Re	distribution due 11/9/2022
11/8 Elec	tion Day	
11/10	Chapter 18 - VRF, MPLS, and MPLS Layer 3 VPNs Explain the impact of VFR and MPLS on routing decisions: Implement VRF-Lite. Explain how MPLS forwards packets. Explain how MPLS Layer 3 VPNs provide peer-to-peer connectivity across a shared network.	18.1.2 Lab - Implement VRF-Lite
11/15	Chapter 19 - DMVPN Tunnels Implement DMVPN tunnels: Explain the purpose and benefits of GRE tunnels. Describe the features and purpose of NHRP. Explain how DMVPN benefits network administrators. Implement DMVPN. Explain how to avoid common issues with overlay networks. Explain how DMVPN mechanisms detect failure to provide a resilient network. Implement IPv6 DMVPN.	 19.1.2 Lab - Implement a GRE Tunnel 19.1.3 Lab - Implement a DMVPN Phase 1 Hub-to-Spoke Topology 19.1.4 Lab - Implement a DMVPN Phase 3 Spoke-to-Spoke Topology 19.1.5 Lab - Implement an IPv6 DMVPN Phase 3 Spoke-to-Spoke Topology
11/17	Chapton 20 Socuring DAV/PN Tunnels	Configure GRE
11/1/	Configure IPsec DMVPN with Pre-Shared Authentication: Explain the requirements of secure communications including integrity, authentication, and confidentiality. Explain how the IPsec framework is used to secure network traffic. Configure IPsec DMVPN with Pre-Shared Authentication.	Tunnels 20.2.1 Packet Tracer - Configure and Verify a Site-to-Site IPsec VPN using CLI
11/22	Review	Labs due date 11/22/2022
Chapter Group Exam - VPNs - Due 11/28/2022		
11/24 Thanksgiving Day		

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11/29	Chapter 21 - Troubleshooting ACLs and Prefix Troubleshoot ACLs and Prefix Lists. Troubleshoot complex ACL implementations. Troubleshoot IPv6 ACLs. Troubleshoot Prefix Lists. Troubleshoot miscellaneous ACL and prefix list issues.	 21.1.2 Lab - Troubleshoot IPv4 ACLs 21.1.3 Lab - Troubleshoot IPv6 ACLs 21.1.4 Lab - Troubleshoot Prefix Lists 21.2.1 Packet Tracer - Configure Extended IPv4 ACLs 21.2.2 Packet Tracer - Configure IPv6 ACL c 	
12/1	Chapter 22 - Infrastructure Security Troubleshoot security threats to a network: Troubleshoot Cisco IOS AAA. Troubleshoot Unicast Reverse Path Forwarding (uRPF). Troubleshooting Control Plane Policing (CoPP). Describe IPv6 First-Hop Security features.	22.1.2 Lab - Troubleshoot IOS AAA 22.1.3 Lab - Troubleshoot uRPF 22.1.4 Lab - Troubleshoot CoPP	
12/6	Chapter 23 - Device Management & Management Tools Troubleshoot Device Management and Management Tools: Troubleshoot Device Management Access. Troubleshoot Device Management Tools.	 23.1.2 Lab - Troubleshoot Device Access and File Transfer 23.1.3 Lab - Troubleshoot SNMP and Logging Issues 23.1.4 Lab - Troubleshoot IP SLA and Netflow 	
		23.2.1 Packet Tracer - Logging Network Activity 23.2.2 Packet Tracer - Explore a NetFlow Implementation	
12/8	Review	Labs due date 12/8/2022	
Chapte	er Group Exam - Infrastructure Security and Mana	gement - Due 12/12/2022	
12/13	Practical Exam – Group 1 (3 hours, in class)		
12/15	Practical Exam – Group 2 (3hours in class)		
12/20	20 Final Exam - in class		

Labs must be done in class during assigned time.

Packet Tracer activities must be uploaded to the netacad by due date.

Additional assignments may be added to this course.

Schedule may be subject to change.