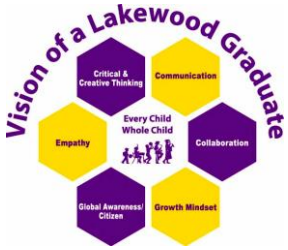
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Suggested Pacing	Content Standards What must students know and be able to do?	Learning and Performance Expectations	Assessment of Learning Options How will we know if they learned this skill?	Learning Resources Options What will we do if they didn't, and what if they did?
Networking operating systems (145040) **Module 1**				
5 Days	**Strand 2. IT Fundamentals** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome 2.4. Emerging Technologies **Competencies** 2.4.1. Investigate the scope and the impact of mobile computing environments on society.	Explain the advances in modern network technologies.	**Pre-assessment** ➢ For SLO **Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.

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			➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	
	Outcome: 2.2. Networking Fundamentals **Competencies** 2.2.2. Select the basic point-to-point (PTP) and point-to-multipoint (PTMP) network topologies (e.g., star, ring, tree, network, mesh, irregular) and broadband and baseband transmission methods.	Explain how host and network devices are used.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 2.2. Networking Fundamentals **Competencies** 2.2.4. Differentiate between the Internet, intranets, and extranets.	Explain network representations and how they are used in network topologies.		

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	Outcome: 2.2. Networking Fundamentals **Competencies** 2.2.4. Differentiate between the Internet, intranets, and extranets.	Compare the characteristics of common types of networks.		
	Outcome: 2.2. Networking Fundamentals **Competencies** 2.2.1. Differentiate between Local Area Networks (LANs), Wide Area Networks (WANs), Wireless Local Area Networks (WLANs), and Near Field Communication (NFC).	Explain how LANs and WANs interconnect to the internet.		
	Outcome: 2.10. Equipment **Competencies** 2.10.3. Identify architecture requirements.	Describe the four basic requirements of a reliable network.		
	Outcome 2.4. Emerging Technologies **Competencies** 2.4.4. Describe emerging technologies (e.g., Bring your Own Device [BYOD], Services Virtualization, Augmented Reality	Explain how trends such as BYOD, online, and cloud computing are changing the way we interact.		

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	[AR], SMART Devices, Additive Manufacturing [3D Printing]).			
	Outcome: 2.1. Security, Risks, and Safeguards **Competencies** 2.1.7. Describe the need for security in networking (e.g., firewall, access controls, encryption, demilitarized zone).	Identify some basic security threats and solutions for all networks.		
	Outcome: 1.1 REQUIRED Employability Skills **Competencies** 1.1.2. Identify the scope of career opportunities	Explain employment opportunities in the networking field.		
Networking operating systems (145040) **Module 2**				
4 Days	**Strand 2. IT Fundamentals** **Strand 4. Infrastructure Systems**			

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	ODE Standards: **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 2.10. Equipment **Competencies** 2.10.5. Prepare and operate equipment per project design specifications.	Implement initial settings including passwords, IP addressing, and default gateway parameters in a network switch and end devices.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome: 2.10. Equipment **Competencies** 2.10.2. Identify processor, memory, storage, power and environmental requirements.	Explain how to access a cisco IOS device for configuration purposes.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_fee

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				dback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.6. Configure and build a network.	Explain how to navigate cisco IOS to configure network devices.		
	Outcome: 2.10. Equipment **Competencies** 2.10.1. Identify hardware platforms, configurations, and support models.	Describe the command structure of Cisco IOS software.		
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.6. Configure and build a network.	Configure a Cisco IOS device using CLI.		
	Outcome: 2.10. Equipment **Competencies** 2.10.2. Identify processor,	Use IOS commands to save the running configuration.		



	memory, storage, power and environmental requirements.			
	Outcome: 4.1. Network Infrastructure **Outcome: 4.3. Network Media** **Competencies** 4.1.2. Explain packet switching techniques. 4.3.2. Differentiate between media types (e.g., coaxial, twisted pair, fiber optic) and interfaces. 4.3.3. Compare media categories (e.g., single mode, multimode, CAT5, CAT5E, CAT6+).	Explain how devices communicate across network media.		
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.6. Configure and build a network.	Configure a host device with an IP address.		
	Outcome: 2.11. Troubleshooting	Verify connectivity between two end devices.		

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	Competencies 2.11.6. Test a solution.			
Networking operating systems (145040) **Module 3**				
4 Days	**Strand 4.Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 4.2. Open Systems Interconnection **Competencies** 4.2.6. Explain how the Open Systems Interconnection layers relate to the elements of network communication.	Explain how network protocols enable devices to access local and remote network resources.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed

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			➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.3. Compare the characteristics of connection-oriented and connectionless protocols and select protocols based on given criteria.	Describe the types of rules that are necessary to successfully communicate.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes .
	Outcome: 4.2. Open Systems Interconnection **Competencies** 4.2.1. Identify the benefits of using a layered network model.	Explain the purpose of adhering to a protocol suite.		
	Outcome: 4.2. Open Systems Interconnection	Explain the role of standards organizations in establishing protocols for network interoperability.		

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	Competencies 4.2.5. Describe actions to be performed at each of the Open Systems Interconnection physical layers.			
	Outcome: 4.2. Open Systems Interconnection **Competencies** 4.2.3. Compare the seven layers of the Open Systems Interconnection stack to the four layers of the Transmission Control Protocol/Internet Protocol (TCP/IP) stack.	Explain how the TCP/IP model and the OSI model are used to facilitate standardization in the communication process.		
	Outcome: 4.2. Open Systems Interconnection **Competencies** 4.2.4. Compare the basics of Transmission Control Protocol/Internet layers, components, and functions.	Explain how data encapsulation allows data to be transported across the network.		
	Outcome: 4.2. Open Systems Interconnection **Competencies** 4.2.6. Explain how the Open Systems Interconnection layers relate to the elements of network	Explain how local hosts access local resources on a network.		

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	communication.			
Networking operating systems (145040) **Module 4**				
2 Days	**Strand 2. IT Fundamentals** **Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 2.2. Networking Fundamentals **Competencies** 2.2.4. Differentiate between the Internet, intranets, and extranets.	Explain how physical layer protocols, services and network media support communications across data networks.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.

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			➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	
	Outcome: 2.2. Networking Fundamentals **Outcome: 2.10. Equipment** **Outcome: 4.3. Network Media** **Competencies** 2.2.3. Select network storage techniques (e.g., fiber channel, Internet Small Computer System Interface [iSCSI], Fiber Channel over Ethernet [FCoE], Serial Attached SCSI [SAS], Network File Systems [NFS], Network Attached Storage/Server Message Blocks [NAS/SMB]). 2.10.8. Prepare equipment for storage or decommissioning. 4.3.4. Describe types of media connectors (e.g., Bayonet Neill-Concelman [BNC], Registered Jack [RJ]-45, LC, ST) and grounding techniques. 4.3.5. Identify media standards (e.g., American National Standards Institute [ANSI],	Describe characteristics of the physical layer.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes

	Electronic Industries Alliance/Telecommunications Industry Association [EIA/TIA]-568, EIA/TIA-568A and 568B).			
	Outcome: 2.2. Networking Fundamentals **Outcome: 4.3. Network Media** **Competencies** 2.2.6. Differentiate between cable types (e.g., fiber optic, twisted pair, coaxial) and interfaces. 4.3.6. Identify the advantages and disadvantages of cabling systems. 4.3.7. Describe typical problems associated with cable installation.	Identify the basic characteristics of copper cabling.		
	Outcome: 2.2. Networking Fundamentals **Outcome: 4.3. Network Media** **Competencies** 2.2.6. Differentiate between cable types (e.g., fiber optic, twisted pair, coaxial) and interfaces.	Explain how UTP cable is used in Ethernet networks.		

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	4.3.8. Assemble and test Ethernet cable (e.g., straight-through, crossover, loopback).			
	Outcome: 2.2. Networking Fundamentals **Competencies** 2.2.6. Differentiate between cable types (e.g., fiber optic, twisted pair, coaxial) and interfaces.	Describe fiber-optic cabling and its main advantages over other media.		
Networking operating systems (145040) **Module 5**				
4 Days	**Strand 2. IT Fundamentals** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			

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	Outcome 2.3. Data Encoding **Competencies** 2.3.1. Identify and explain coding information and representation of characters (e.g., American Standard Code for Information Interchange [ASCII], Extended Binary Coded Decimal Interchange Code [EBCDIC], Unicode). 2.3.2. Convert between numbering systems (e.g., binary, hexadecimal, decimal).	Calculate numbers between decimal, binary, and hexadecimal systems.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome 2.3. Data Encoding **Competencies** 2.3.1. Identify and explain coding information and representation of characters (e.g., American Standard Code for Information Interchange [ASCII], Extended Binary Coded Decimal Interchange Code [EBCDIC], Unicode). 2.3.2. Convert between numbering systems (e.g., binary, hexadecimal, decimal).	Calculate numbers between decimal and binary systems.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback

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				➢ netacad.com/courses/quizzes
Networking operating systems (145040) **Module 6**				
2 Days	**Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 4.5. Wireless Network Solutions **Outcome: 4.8. Network Architecture** **Competencies** 4.5.1. Compare secure wireless solutions operating in ad-hoc mode and infrastructure mode	Explain how media access control in the data link layer supports communication across networks	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.

	4.8.1. Describe media-access protocols (e.g., Carrier Sense Multiple Access with Collision Detection [CSMA/CD], Carrier Sense Multiple Access with Collision Avoidance [CSMA/CA]).		➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	
	Outcome: 4.2. Open Systems Interconnection **Competencies** 4.2.4. Compare the basics of Transmission Control Protocol/Internet layers, components, and functions.	Describe the purpose and function of the data link layer in preparing communication for transmission on specific media.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 4.5. Wireless Network Solutions **Outcome: 4.8. Network Architecture**	Compare the characteristics of media access control methods on WAN and LAN topologies.		

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	Outcome: 4.12. Wide Area Network **Competencies** 4.5.3. Describe the Service Set Identifier (SSID) as used in wireless communications. 4.8.3. Identify Local Area Network (LAN) performance factors (e.g., signal attenuation, signal propagation delay). 4.12.5. Determine availability from Local Area Network (LAN) to meet WAN requirements.			
	Outcome: 4.2. Open Systems Interconnection **Competencies** 4.2.2. Compare Open Systems Interconnection stack positions and their relationships to one another.	Describe the characteristics and function of the data link frame.		
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Module 7				
4 Days	**Strand 2. IT Fundamentals** **Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 2.2. Networking Fundamentals **Competencies** 2.2.8. Describe the characteristics and uses of networks, network devices, and components (e.g., hubs, switches, routers, firewalls).	Explain how the Ethernet operates in a switched network.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome: 4.2. Open Systems Interconnection **Competencies** 4.2.4. Compare the basics of	Explain how the Ethernet sublayers are related to the frame fields.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/cou

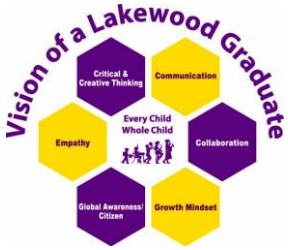
	Transmission Control Protocol/Internet layers, components, and functions.		➢ Project	rses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 4.8. Network Architecture **Competencies** 4.8.1. Describe media-access protocols	Describe the Ethernet mac address		
	Outcome: 4.8. Network Architecture **Competencies** 4.8.4. Explain the role of the Internet Engineering Task Force (IETF) in facilitating protocol development.	Explain how the switch builds its mac address table and forwards frames.		
	Outcome: 4.1. Network Infrastructure **Competencies**	Describe switch forwarding methods and port settings available on layer 2 switch ports.		

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	4.1.2. Explain packet switching techniques			
Networking operating systems (145040) **Module 8**				
3 Days	**Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 4.6. Network Protocols **Competencies** 4.6.4. Explain the difference between User Datagram Protocol (UDP) and Transmission Control Protocol (TCP).	Explain how routers use network layer protocols and services to enable end-to-end connectivity.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.

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			➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	
	Outcome: 4.6. Network Protocols **Competencies** 4.6.3. Explain the purposes of encapsulation and decapsulation and their relationship to the Open Systems Interconnection (OSI) model.	Explain how the network layer uses IP protocols for reliable communications.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 4.6. Network Protocols **Competencies** 4.6.1. Explain network protocols (e.g., Transmission Control Protocol/Internet Protocol [TCP/IP], User Datagram Protocol [UDP], Internet Protocol Version 4 [IPv4], Internet Protocol Version 6 [IPv6]).	Explain the role of major header fields in the Ipv4 packet.		

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	Outcome: 4.6. Network Protocols **Competencies** 4.6.1. Explain network protocols (e.g., Transmission Control Protocol/Internet Protocol [TCP/IP], User Datagram Protocol [UDP], Internet Protocol Version 4 [IPv4], Internet Protocol Version 6 [IPv6]).	Explain the role of major header fields in the Ipv6 packet.		
	Outcome: 4.6. Network Protocols **Competencies** 4.6.5. Identify Transmission Control Protocol (TCP)and User Datagram Protocol (UDP) conventional ports (e.g., Simple Mail Transfer Protocol [SMTP], Telnet, Hypertext Transfer Protocol [HTTP], File Tranfer Protcol [FTP]).	Explain how network devices use routing tables to direct packets to a destination network.		
	Outcome: 4.6. Network Protocols **Competencies** 4.6.6. Explain Transmission Control Protocol/Internet Protocol (TCP/IP) protocol details (e.g., Internet addresses, Address Resolution Protocol [ARP],	Explain the function of fields in the rooting table of a router.		

	Reverse Address Resolution Protocol [RARP], IP datagram format, routing IP datagrams, TCP segment format, IPv4, IPv6).			
Networking operating systems (145040) **Module 9**				
2 Days	**Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 4.7. Transmission Control Protocol/Internet Protocol (TCP/IP) **Competencies** 4.7.1. Explain Fully Qualified	Explain how ARP and ND enable communication on a network.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They

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	Domain Names (FQDNs) and how they are used.		➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	will then be reassessed.
	Outcome: 4.7. Transmission Control Protocol/Internet Protocol (TCP/IP) **Competencies** 4.7.2. Explain the IP addressing scheme and how it is used.	Compare the roles of the MAC address and the IP address.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 4.6. Network Protocols Compare network protocols. **Competencies** 4.6.6. Explain Transmission Control Protocol/Internet Protocol (TCP/IP) protocol details (e.g.,	Describe the purpose of ARP.		

	Internet addresses, Address Resolution Protocol [ARP], Reverse Address Resolution Protocol [RARP], IP datagram format, routing IP datagrams, TCP segment format, IPv4, IPv6).			
	Outcome: 4.7. Transmission Control Protocol/Internet Protocol (TCP/IP) **Competencies** 4.7.4. Identify the class of network to which a given address belongs.	Describe the operation of Ipv6 neighbor discovery.		
Networking operating systems (145040) **Module 10**				
2 Days	**Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5,**			

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	RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8			
	Outcome: 4.10. Network Administration **Competencies** 4.10.1. Select physical and logical topology.	Implement initial settings on a router and end devices.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome: 4.10. Network Administration **Competencies** 4.10.8. Configure network domain accounts and profiles.	Configure initial settings on a cisco IOS router.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback

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				➢ netacad.com/courses/quizzes
	Outcome: 4.10. Network Administration **Competencies** 4.10.2. Connect devices to network systems.	Configure two active interfaces on a cisco IOS router		
	Outcome: 4.10. Network Administration **Competencies** 4.10.5. Create user accounts, groups, and login scripts.	Configure devices to use the default gateway.		
Networking operating systems (145040) **Module 11**				
5 Days	**Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2,**			

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	RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8			
	Outcome: 4.7. Transmission Control Protocol/Internet Protocol **Competencies** 4.7.9. Create custom subnet masks to meet network design requirements.	Calculate an IPv4 subnetting scheme to efficiently segment a network.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome: 4.7. Transmission Control Protocol/Internet Protocol **Competencies** 4.7.2. Explain the IP addressing scheme and how it is used.	Describe the structure of an IPv4 address including the network portion, the host portion, and the subnet mask.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedb

				ack ➢ netacad.com/courses/quizzes
	Outcome: 4.7. Transmission Control Protocol/Internet Protocol **Competencies** 4.7.8. Identify multicasting addresses and explain why they are used.	Compare the characteristics and uses of the unicast, broadcast and multicast IPv4 addresses.		
	Outcome: 4.7. Transmission Control Protocol/Internet Protocol **Competencies** 4.7.3. Identify Class A, B, and C reserved (i.e., private) address ranges and why they are used.	Explain public, private, and reserved IPv4 addresses.		
	Outcome: 4.7. Transmission Control Protocol/Internet Protocol **Competencies** 4.7.5. Differentiate between default subnet masks and custom subnet masks.	Explain how subnetting segments a network to enable better communication.		

	4.7.6. Explain the relationship between an IP address and its associated subnet mask.			
	Outcome: 4.7. Transmission Control Protocol/Internet Protocol **Competencies** 4.7.4. Identify the class of network to which a given address belongs.	Calculate IPv4 subnets for a 124 prefix.		
	Outcome: 4.7. Transmission Control Protocol/Internet Protocol **Competencies** 4.7.4. Identify the class of network to which a given address belongs. 4.7.7. Identify the differences between classful and classless addressing schemes.	Calculate IPv4 subnets for a /16 and 18 prefix.		
	Outcome: 4.7. Transmission Control Protocol/Internet Protocol **Competencies**	Explain how to create a flexible addressing scheme using variable length subnet masking (VLSM).		

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	4.7.9. Create custom subnet masks to meet network design requirements.			
Networking operating systems (145040) **Module 12**				
6 Days	**Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 4.7. Transmission Control Protocol/Internet Protocol **Competencies** 4.7.2. Explain the IP addressing scheme and how it is used.	Implement an IPv6 addressing scheme.		

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	Outcome: 4.7. Transmission Control Protocol/Internet Protocol **Competencies** 4.7.10. Compare Internet Protocol Version 4 (IPv4) and Internet Protocol Version 6 (IPv6).	Explain the need for IPv6 addressing.		
	Outcome: 4.7. Transmission Control Protocol/Internet Protocol **Competencies** 4.7.2. Explain the IP addressing scheme and how it is used.	Explain how IPv6 addresses are represented.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome: 4.7. Transmission Control Protocol/Internet Protocol **Competencies** 4.7.4. Identify the class of network to which a given address belongs.	Compare types of IPv6 network addresses.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.neta

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				cad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 4.7. Transmission Control Protocol/Internet Protocol **Competencies** 4.7.4. Identify the class of network to which a given address belongs.	Explain how to configure static global unicast and link local IPv6 network addresses.		
	Outcome: 4.7. Transmission Control Protocol/Internet Protocol **Competencies** 4.7.2. Explain the IP addressing scheme and how it is used.	Explain how to configure global unicast addresses dynamically.		
	Competencies 4.6.2. Identify the advantages of protocols	Dynamic Addressing for IPv6 LLAS		
	Outcome: 4.7. Transmission Control Protocol/Internet Protocol	Identify IPv6 addresses.		

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	Competencies 4.7.2. Explain the IP addressing scheme and how it is used.			
	Outcome: 4.7. Transmission Control Protocol/Internet Protocol **Competencies** 4.7.9. Create custom subnet masks to meet network design requirements.	Subnet an IPv6 Network		
Networking operating systems (145040) **Module 13**				
2 Days	**Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1,**			

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	WHST.11-12.6, WHST.11-12.7, WHST.11-12.8			
	Outcome: 4.9. Network Operating Systems **Competencies** 4.9.8. Evaluate the performance of the network Operating System	ICMP Use various tools to test network connectivity.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome: 4.9. Network Operating Systems **Competencies** 4.9.8. Evaluate the performance of the network Operating System	Explain how ICMP is used to test network connectivity.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 4.10. Network	Use ping and traceroute utilities to		

	Administration **Competencies** 4.10.10. Troubleshoot network performance connectivity	test network connectivity.		
Networking operating systems (145040) **Module 14**				
3 Days	**Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 4.6. Network Protocols **Competencies** 4.6.4. Explain the difference between User Datagram Protocol (UDP) and Transmission Control	Transport Layer Compare the operations of transport layer protocols in supporting end-to-end communication.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be

	Protocol (TCP).		➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	reassessed.
	Outcome: 4.6. Network Protocols **Competencies** 4.6.1. Explain network protocols	Explain the purpose of the transport layer in managing the transportation of data in end-to-end communication.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 4.6. Network Protocols **Competencies** 4.6.4. Explain the difference between User Datagram Protocol (UDP) and Transmission Control Protocol (TCP).	Explain characteristics of the UDP.		

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	Outcome: 4.6. Network Protocols **Competencies** 4.6.4. Explain the difference between User Datagram Protocol (UDP) and Transmission Control Protocol (TCP).	Explain characteristics of the TCP.		
	Outcome: 4.6. Network Protocols **Competencies** 4.6.2. Identify the advantages of protocols (e.g., Domain Name System [DNS], File Transfer Protocol [FTP], Hypertext Transfer Protocol [HTTP], Telecommunications Network [Telnet], Remote Desktop Protocol [RDP]], Secure Shell [SSH]) and associated port numbers.	Explain how TCP and UDP use port numbers.		
	Outcome: 4.6. Network Protocols **Competencies** 4.6.5. Identify Transmission Control Protocol (TCP)and User Datagram Protocol (UDP) conventional ports (e.g., Simple Mail Transfer Protocol [SMTP], Telnet, Hypertext Transfer	Explain how TCP session establishment and termination processes facilitate reliable communication.		

	Protocol [HTTP], File Tranfer Protcol [FTP]).			
	Outcome: 4.6. Network Protocols **Competencies** 4.6.5. Identify Transmission Control Protocol (TCP)and User Datagram Protocol (UDP) conventional ports (e.g., Simple Mail Transfer Protocol [SMTP], Telnet, Hypertext Transfer Protocol [HTTP], File Tranfer Protcol [FTP]).	Describe the UDP client processes to establish communication with a server.		
Networking operating systems (145040) **Module 15**				
3 Days	**Strand 2. IT Fundamentals** **Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2,**			

	RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8			
	Outcome: 2.2. Networking Fundamentals **Outcome: 4.2. Open Systems Interconnection** **Competencies** 2.2.5. Identify and apply Transmission Control Protocol and Internet Protocol (TCP/IP), Internet Protocol Version 4 (IPv4), Internet Protocol Version 6 (IPv6) applications and services (e.g., rlogin, Simple Mail Transfer Protocol [SMTP], Telecommunications Network [Telnet], File Transfer Protocol [FTP], Domain Name System [DNS], Network File System [NFS], Voice over Internet Protocol [VoIP], Internet Control Message Protocol [ICMP]). 4.2.2. Compare Open Systems Interconnection stack positions and their relationships to one another.	Explain the operation of application layer protocols in providing support to end-user applications.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.

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	Outcome: 4.2. Open Systems Interconnection **Competencies** 4.2.6. Explain how the Open Systems Interconnection layers relate to the elements of network communication.	Explain how the functions of the application layer, session layer, and presentation layer work together to provide network services to end user applications.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome 2.7. Web Architecture **Outcome: 4.6. Network Protocols** **Competencies** 2.7.3. Differentiate between a client and a server. 4.9.3. Describe the characteristics of the tiered model (e.g., peer-to-peer, thin client, thick client, cloud).	Explain how end user applications operate in a peer-to peer network.		

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	Outcome: 2.2. Networking Fundamentals **Outcome: 4.6. Network Protocols** **Competencies** 2.2.7. Identify the top-level domains (e.g., .gov, .com, .edu). 4.6.1. Explain network protocols	Explain how web and email protocols operate.		
	Outcome: 4.6. Network Protocols **Competencies** 4.6.1. Explain network protocols	Explain how DNS and DHCP operate.		
	Outcome: 4.6. Network Protocols **Competencies** 4.6.5. Identify Transmission Control Protocol (TCP)and User Datagram Protocol (UDP) conventional ports (e.g., Simple Mail Transfer Protocol [SMTP], Telnet, Hypertext Transfer Protocol [HTTP], File Tranfer Protcol [FTP]).	Explain how file transfer protocols operate.		

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3 Days	**Strand 2. IT Fundamentals** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 2.1. Security, Risks, and Safeguards **Competencies** 2.1.12. Practice information security per job requirements.	Configure switches and routers with device hardening features to enhance security.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.

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	Outcome: 2.1. Security, Risks, and Safeguards **Competencies** 2.1.3. Describe multilevel security.	Explain why basic security measures are necessary on network devices.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 2.1. Security, Risks, and Safeguards **Competencies** 2.1.4. Identify security risks and describe associated safeguards and methodologies	Network Attacks Identify security vulnerabilities.		
	Outcome: 2.1. Security, Risks, and Safeguards **Competencies** 2.1.5. Describe major threats to	Network Attack Mitigation Identify general mitigation techniques.		

	computer systems			
	Outcome: 2.1. Security, Risks, and Safeguards **Competencies** 2.1.11. Identify the need for personal security in digital information and describe how personal information can be safeguarded.	Device Security Configure network devices with device hardening features to mitigate security threats.		
Networking operating systems (145040) **Module 17**				
4 Days	**Strand 2. IT Fundamentals** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			

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	Outcome: 2.10. Equipment **Competencies** 2.10.1. Identify hardware platforms, configurations, and support models.	Implement a network design for a small network to include a router, a switch, and end devices.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome: 2.10. Equipment **Outcome: 4.9. Network Operating Systems** **Competencies** 2.10.3. Identify architecture requirements. 4.9.5. Select network, desktop, and mobile Operating Systems.	Identify the devices used in a small network.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 2.10. Equipment	Identify the protocols and applications used in a small network.		

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	Outcome: 4.9. Network Operating Systems **Competencies** 2.10.2. Identify processor, memory, storage, power and environmental requirements. 4.9.1. Explain how the components of a network operating system (i.e., server platform, network services software, network redirection software, communications software) support network operations			
	Outcome: 2.10. Equipment **Competencies** 2.10.4. Identify software application requirements.	Explain how a small network serves as the basis of larger networks.		
	Outcome:2.11.Troubleshooting **Competencies** 2.11.1. Identify the problem.	Use the output of the ping and tracert commands to verify connectivity and establish relative network performance.		
	Outcome: 2.10. Equipment	Use host and IOS commands to acquire information about the devices in a network.		

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	Outcome: 4.9. Network Operating Systems **Competencies** 2.10.6. Monitor equipment operation and troubleshoot issues and problems. 4.9.7. Log in to a network device (e.g., router, Secure File Transfer Protocol [SFTP] server, directory server).			
	Outcome: 2.10. Equipment **Competencies** 2.11.2. Select troubleshooting methodology	Describe common network troubleshooting methodologies.		
Networking operating systems (145040) **Bridge**				
	Strand 4. Infrastructure Systems			

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	ODE Standards: **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 4.9. Network Operating Systems **Competencies** 4.9.1. Explain how the components of a network operating system (i.e., server platform, network services software, network redirection software, communications software) support network operations. 4.9.2. Identify licensing requirements. 4.9.4. Analyze the advantages and disadvantages of the client/server model.	Learners apply principles of networking and infrastructure related to the installation, administration, and maintenance of computer networks and components.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer **Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed. **Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback

				➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 4.9. Network Operating Systems **Competencies** 4.9.5. Select network, desktop, and mobile Operating Systems. 4.9.6. Install, test, and patch network Operating Systems manually and using automation. 4.9.7. Log in to a network device (e.g., router, Secure File Transfer Protocol [SFTP] server, directory server).	Describe and install network operating systems (OSs).		
Routing and Switching (145055) **Module 1**				
3 Days	**Strand 4. Infrastructure**			

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	Systems **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.6. Configure and build a network	Configure initial settings on a Cisco switch.	**Pre-assessment** ➢ For SLO **Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.6. Configure and build a network	Configure switch ports to meet network requirements	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice

				➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 4.6. Network Protocols **Competencies** 4.6.2. Identify the advantages of protocols (e.g., Domain Name System [DNS], File Transfer Protocol [FTP], Hypertext Transfer Protocol [HTTP], Telecommunications Network [Telnet], Remote Desktop Protocol [RDP]], Secure Shell [SSH]) and associated port numbers.	Configure secure management access on a switch.		
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.6. Configure and build a network	Configure basic settings on a router, using CLI, to route between two directly-connected networks.		

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	Outcome: 4.10. Network Administration **Competencies** 4.10.10. Troubleshoot network performance connectivity (e.g., performance monitor, command line utilities).	Verify connectivity between two networks that are directly connected to a router.		
Routing and Switching (145055) **Module 2**				
2 Days	**Strand 2. IT Fundamentals** **Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
		Explain how Layer 2 switches forward	**Formative**	Students that did not

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	Outcome: 2.2. Networking Fundamentals **Competencies** 2.2.8. Describe the characteristics and uses of networks, network devices, and components (e.g., hubs, switches, routers, firewalls).	data.	➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome: 2.2. Networking Fundamentals **Competencies** 2.2.8. Describe the characteristics and uses of networks, network devices, and components (e.g., hubs, switches, routers, firewalls).	Explain how frames are forwarded in a switched network.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 4.8. Network Architecture	Compare a collision domain to a broadcast domain.		

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	Competencies 4.8.1. Describe media-access protocols (e.g., Carrier Sense Multiple Access with Collision Detection [CSMA/CD], Carrier Sense Multiple Access with Collision Avoidance [CSMA/CA]).			
Routing and Switching (145055) **Module 3**				
4 Days	**Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 4.8. Network Architecture	Implement VLANs and trunking in a switched network.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs	Students that did not pass the summative assessment will study the feedback given

	Competencies 4.8.5 Implement and maintain Virtual Local Area Networks (VLANs).		➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	by the summative assessment. They will then be reassessed.
	Outcome: 4.8. Network Architecture **Competencies** 4.8.5 Implement and maintain Virtual Local Area Networks (VLANs).	Explain the purpose of VLANs in a switched network.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 4.8. Network Architecture **Competencies**	Explain how a switch forwards frames based on VLAN configuration in a multi-switch environment.		

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	4.8.5 Implement and maintain Virtual Local Area Networks (VLANs).			
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.6. Configure and build a network (e.g., server, switch, router).	Configure a switch port to be assigned to a VLAN based on requirements.		
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.6. Configure and build a network (e.g., server, switch, router).	Configure a trunk port on a LAN switch.		
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.6. Configure and build a network (e.g., server, switch, router).	Configure Dynamic Trunking Protocol (DTP).		

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Routing and Switching (145055) **Module 4**				
2 Days	**Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.6. Configure and build a network (e.g., server, switch, router).	Describe options for configuring inter-VLAN routing.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome: 4.1. Network	Configure router-on-a-stick inter-VLAN routing.	**Summative** ➢ Chap prac exam	**Helpful Resources within Netacad**

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	Infrastructure **Competencies** 4.1.6. Configure and build a network (e.g., server, switch, router).		➢ Chapter exam ➢ Skills test ➢ Project	➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.6. Configure and build a network (e.g., server, switch, router).	Configure inter-VLAN routing using Layer 3 switching.		
	Outcome: 4.8. Network Architecture **Competencies** 4.8.5 Implement and maintain Virtual Local Area Networks (VLANs).	Troubleshoot common inter-VLAN configuration issues		

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Routing and Switching (145055) **Module 5**				
3 Days	**Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 4.2. Open Systems Interconnection **Competencies** 4.2.5. Describe actions to be performed at each of the Open Systems Interconnection layers.	Explain how STP enables redundancy in a Layer 2 network.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.

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			➢ Lab (real equipment)	
	Outcome: 4.2. Open Systems Interconnection **Competencies** 4.2.6. Explain how the Open Systems Interconnection layers relate to the elements of network communication.	Explain common problems in a redundant, L2 switched network.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 4.2. Open Systems Interconnection **Competencies** 4.2.4. Compare the basics of Transmission Control Protocol/Internet layers, components, and functions.	Explain how STP operates in a simple, switched network.		

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Routing and Switching (145055) **Module 6**				
3 Days	**Strand 2. IT Fundamentals** **Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 4.3. Network Media **Competencies** 4.3.1. Identify the criteria used in selecting media (e.g., physical properties, transmission technologies, transmission span, bandwidth, topology, security, noise immunity, installation considerations, cost).	Describe EtherChannel technology.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.

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	Outcome: 4.3. Network Media **Competencies** 4.3.1. Identify the criteria used in selecting media (e.g., physical properties, transmission technologies, transmission span, bandwidth, topology, security, noise immunity, installation considerations, cost).	Configure EtherChannel.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Competencies 2.11.3. Investigate symptoms based on the selected methodology.	Troubleshoot EtherChannel.		
Routing and Switching (145055) **Module 7**				

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4 Days	**Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 4.6. Network Protocols **Competencies** 4.6.1. Explain network protocols	Implement DHCPv4 to operate across multiple LANs.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome: 4.6. Network Protocols **Competencies** 4.6.1. Explain network protocols	Explain how DHCPv4 operates across multiple LANs.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/cou

				rses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.6. Configure and build a network (e.g., server, switch, router).	Configure a router as a DHCPv4 server.		
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.6. Configure and build a network (e.g., server, switch, router).	Configure a router as a DHCPv4 client.		
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(145055) **Module 8**				
4 Days	**Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.6. Configure and build a network (e.g., server, switch, router).	Configure dynamic address allocation in IPv6 networks.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome: 4.1. Network Infrastructure	Explain how an IPv6 host can acquire its IPv6 configuration.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules

	Competencies 4.1.6. Configure and build a network (e.g., server, switch, router).		➢ Project	➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 4.6. Network Protocols **Competencies** 4.6.6. Explain Transmission Control Protocol/Internet Protocol (TCP/IP) protocol details (e.g., Internet addresses, Address Resolution Protocol [ARP], Reverse Address Resolution Protocol [RARP], IP datagram format, routing IP datagrams, TCP segment format, IPv4, IPv6).	Explain the operation of SLAAC.		
	Outcome: 4.6. Network Protocols	Explain the operation of DHCPv6.		

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	Competencies 4.6.6. Explain Transmission Control Protocol/Internet Protocol (TCP/IP) protocol details (e.g., Internet addresses, Address Resolution Protocol [ARP], Reverse Address Resolution Protocol [RARP], IP datagram format, routing IP datagrams, TCP segment format, IPv4, IPv6).			
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.6. Configure and build a network (e.g., server, switch, router).	Configure a stateful and stateless DHCPv6 server.		
Routing and Switching (145055) **Module 9**				
2 Days	**Strand 4. Infrastructure Systems**			

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	ODE Standards: **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.2. Explain packet switching techniques.	Explain how FHRPs provide default gateway services in a redundant network.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.2. Explain packet switching techniques.	Explain the purpose and operation of first hop redundancy protocols.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_fee

				dback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.2. Explain packet switching techniques.	Explain how HSRP operates.		
Routing and Switching (145055) **Module 10**				
4 Days	**Strand 3. Information Security** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			

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	Outcome: 3.3. Network Security **Competencies** 3.3.5. Assess risks based on vulnerability of the organization, likelihood of risk, and impact on the organization.	Explain how vulnerabilities compromise LAN security.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome: 3.3. Network Security **Competencies** 3.3.3. Devise account administration functions to support network security.	Explain how to use endpoint security to mitigate attacks.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 3.1. Components of	Explain how AAA and 802.1x are used to authenticate LAN endpoints		

	Information Security **Competencies** 3.1.1. Differentiate between authentication and authorization.	and devices.		
	Outcome: 3.4. Multilayer Defense Structure **Competencies** 3.4.2. Analyze system log files to identify security risks.	Identify Layer 2 vulnerabilities.		
	Outcome: 3.5. Wireless Security **Competencies** 3.5.2. Compare methods of increasing the security of wireless networks and devices (e.g., Media Access Control [MAC] address filtering, Wi-Fi Protected Access [WPA], 802.1x, Remote Authentication Dial In User Service [RADIUS]).	Explain how a MAC address table attack compromises LAN security.		
	Outcome: 3.3. Network Security **Competencies**	Explain how LAN attacks compromise LAN security.		

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	3.3.5. Assess risks based on vulnerability of the organization, likelihood of risk, and impact on the organization.			
Routing and Switching (145055) **Module 11**				
4 Days	**Strand 3. Information Security** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 3.3. Network Security **Competencies** 3.3.1. Describe network security policies (e.g., acceptable use policy).	Implement switch security to mitigate LAN attacks.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.

			➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	
	Outcome: 3.3. Network Security **Competencies** 3.3.2. Identify security appliances and describe the role of each in a networked environment.	Implement port security to mitigate MAC address table attacks.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 3.3. Network Security **Competencies** 3.3.3. Devise account administration functions to support network security.	Explain how to configure DTP and native VLAN to mitigate VLAN attacks.		
		Explain how to configure DHCP		

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	Outcome: 3.3. Network Security **Competencies** 3.3.4. Describe Access Control Lists (ACLs) and explain why they are used.	snooping to mitigate DHCP attacks.		
	Outcome: 3.3. Network Security **Competencies** 3.3.5. Assess risks based on vulnerability of the organization, likelihood of risk, and impact on the organization.	Explain how to configure ARP inspection to mitigate ARP attacks.		
	Outcome: 3.3. Network Security **Competencies** 3.3.7. Train users in network security procedures.	Explain how to configure Portfast and BPDU Guard to mitigate STP attacks.		
Routing and Switching (145055) **Module 12**				

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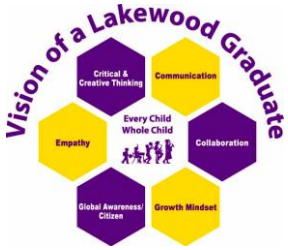
5 Days	**Strand 3. Information Security** **Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 4.4. Wireless Communications **Competencies** 4.4.2. Compare characteristics of wireless signals (e.g., reflection, diffraction, scattering, fading).	Explain how WLANs enable network connectivity.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome: 4.4. Wireless Communications **Competencies** 4.4.1. Compare wireless	Describe WLAN technology and standards.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-

	standards in common use (e.g., Institute of Electrical and Electronics Engineers [IEEE] 802.11, Cellular, Bluetooth, Worldwide Interoperability for Microwave Access [WiMAX], Radio Frequency Identification [RFID], Near Field Communication [NFC]).			concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 4.4. Wireless Communications **Competencies** 4.4.3. Differentiate media access methods used by wireless.	Describe the components of a WLAN infrastructure.		
	Outcome: 4.4. Wireless Communications **Competencies** 4.4.4. Describe appropriate applications of wireless technologies to specific communication scenarios.	Explain how wireless technology enables WLAN operation.		
		Explain how a WLC uses CAPWAP to		

	Outcome: 4.4. Wireless Communications **Competencies** 4.4.5. Compare Radio Frequency functions and principles	manage multiple APs.		
	Outcome: 4.4. Wireless Communications **Competencies** 4.4.1. Compare wireless standards in common use (e.g., Institute of Electrical and Electronics Engineers [IEEE] 802.11, Cellular, Bluetooth, Worldwide Interoperability for Microwave Access [WiMAX], Radio Frequency Identification [RFID], Near Field Communication [NFC]).	Describe channel management in a WLAN.		
	Outcome: 3.5. Wireless Security **Competencies** 3.5.1. Describe wireless security risks (e.g., unauthorized access) and how to mitigate them.	Describe threats to WLANs.		

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	Outcome: 3.5. Wireless Security **Competencies** 3.5.5. Describe security practices and policies for personal devices.	Describe WLAN security mechanisms.		
Routing and Switching (145055) **Module 13**				
3 Days	**Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 4.5. Wireless Network Solutions	Implement a WLAN using a wireless router and WLC.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs	Students that did not pass the summative assessment will study the feedback given

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	Competencies 4.5.4. Select and install access points, wireless Network Interface Cards (NICs), antennas, and other hardware and software components to provide a wireless networking solution as determined by a site and customer survey.		➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	by the summative assessment. They will then be reassessed.
	Outcome: 4.5. Wireless Network Solutions **Competencies** 4.5.2. Describe the frequency ranges and associated rules in the wireless spectrum as managed by the Federal Communication Commission (FCC).	Configure a WLAN to support a remote site.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 4.5. Wireless Network Solutions **Competencies**	Configure a WLC WLAN to use the management interface and WPA2 PSK authentication.		

	4.5.6. Secure the wireless network.			
	Outcome: 4.5. Wireless Network Solutions **Competencies** 4.5.6. Secure the wireless network.	Configure a WLC WLAN to use a VLAN interface, a DHCP server, and WPA2 Enterprise authentication.		
	Outcome: 4.5. Wireless Network Solutions **Competencies** 4.5.5. Troubleshoot Wireless Local Area Networks (WLANs) using system logs, vendor-provided utilities, and diagnostic tools.	Troubleshoot common wireless configuration issues.		
Routing and Switching (145055) **Module 14**				
3 Days	**Strand 4. Infrastructure Systems**			

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	ODE Standards: **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.2. Explain packet switching techniques.	Explain how routers use information in packets to make forwarding decisions.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Student that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.3. Compare the characteristics of connection-oriented and connectionless protocols and select protocols based on given criteria.	Explain how routers determine the best path.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.neta

				cad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.1. Determine the basic point-to-point (PTP) and point-to-multipoint (PTMP) network topologies (e.g., star, ring, tree, mesh, hybrid) and identify broadband and baseband (e.g., Ethernet) transmission methods and standards.	Explain how routers forward packets to the destination.		
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.6. Configure and build a network (e.g., server, switch, router).	Configure basic settings on a Cisco IOS router.		
	Outcome: 4.12. Wide Area	Describe the structure of a routing table.		

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	Network **Competencies** 4.12.10 Implement and maintain routing tables (e.g., static, default and dynamic routes).			
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.4. Identify standard and emerging network technologies (e.g., broadband, satellite, optic, cellular, Local-Area Network (LAN) and WiFi).	Compare static and dynamic routing concepts.		
Routing and Switching (145055) **Module 15**				
3 Days	**Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2,**			

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	RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8			
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.6. Configure and build a network (e.g., server, switch, router).	Configure IPv4 and IPv6 static routes.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome: 4.12. Wide Area Network **Competencies** 4.12.9. Evaluate and select routing protocols (e.g., Border Gateway Routing Protocol [BGRP], Open Shortest Path First [OSPF], Routing Information Protocol Version 2 [RIPv2]).	Describe the command syntax for static routes.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedb

				ack ➢ netacad.com/courses/quizzes
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.6. Configure and build a network (e.g., server, switch, router).	Configure IPv4 and IPv6 static routes.		
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.6. Configure and build a network (e.g., server, switch, router).	Configure IPv4 and IPv6 default static routes.		
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.6. Configure and build a network (e.g., server, switch, router).	Configure a floating static route to provide a backup connection.		
	Outcome: 4.1. Network	Configure IPv4 and IPv6 static host routes that direct traffic to a specific		

	Infrastructure **Competencies** 4.1.6. Configure and build a network (e.g., server, switch, router).	host.		
Routing and Switching (145055) **Module 16**				
2 Days	**Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 4.10. Network Administration **Competencies** 4.10.10. Troubleshoot network	Troubleshoot static and default route configurations.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They

	performance connectivity (e.g., performance monitor, command line utilities).		➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	will then be reassessed.
	Outcome: 4.12. Wide Area Network **Competencies** 4.12.8. Evaluate and select transmission options.	Explain how a router processes packets when a static route is configured.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
Routing and Switching (145055) **Bridge**				

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	Strand 4. Infrastructure Systems **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 4.10. Network Administration **Competencies** 4.10.3. Create domain trusts. 4.10.4. Maintain domain controllers. 4.10.7. Define and set access controls on files, folders, shares, and directories	Learners apply principles of networking and infrastructure related to the installation, administration, and maintenance of computer networks and components	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome: 4.9. Network Operating Systems **Outcome: 4.10. Network Administration** **Competencies**	Administer network operating systems and services.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/cou

	4.9.2. Identify licensing requirements. 4.10.9. Create roaming user profiles and use Group Policy Objects (GPO) to manage the user environment. 4.10.12. Securely delegate standard management tasks.			rses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
Network Management (145045) **Module 1**				
3 Days	**Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 4.12. Wide Area	Describe basic OSPF features and characteristics.	**Pre-assessment** ➢ For SLO	Students that did not pass the summative

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	Network **Competencies** 4.12.8. Evaluate and select transmission options.		**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome: 4.12. Wide Area Network **Competencies** 4.12.7. Determine the subnets needed on the WAN	Describe the OSPF packet types used in single-area OSPF.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
		Explain how single-area OSPF		

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	Outcome: 4.12. Wide Area Network **Competencies** 4.12.9. Evaluate and select routing protocols (e.g., Border Gateway Routing Protocol [BGRP], Open Shortest Path First [OSPF], Routing Information Protocol Version 2 [RIPv2]).	operates.		
Network Management (145045) **Module 2**				
3 Days	**Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 4.12. Wide Area Network	Configure single-area OSPFv2 in a point-to-point network.	**Formative** ➢ Guided notes ➢ Online activities	Students that did not pass the summative assessment will study

	Competencies 4.12.2. Describe point-to-point (PTP) and point-to-multipoint (PTMP) interconnection		➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	the feedback given by the summative assessment. They will then be reassessed.
	Outcome: 4.12. Wide Area Network **Competencies** 4.12.3. Evaluate and select basic telecommunications services	Configure the OSPF interface priority to influence the DR/BDR election in a multiaccess network.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 4.12. Wide Area Network **Competencies**	Implement modifications to change the operation of single area OSPFv2.		

	4.12.1. Select WAN connections			
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.6. Configure and build a network.	Configure OSPF to propagate a default route.		
	Outcome: 4.9. Network Operating Systems **Competencies** 4.9.8. Evaluate the performance of the network Operating System.	Verify a single-area OSPFv2 implementation.		
Network Management (145045) **Module 3**				
4 Days	**Strand 3. Information Security** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5,**			

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	RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8			
	Outcome: 3.3. Network Security **Competencies** 3.3.1. Describe network security policies (e.g., acceptable use policy).	Describe the current state of cybersecurity and vectors of data loss.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome: 3.3. Network Security **Competencies** 3.3.2. Identify security appliances and describe the role of each in a networked environment.	Describe the threat actors who exploit networks.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback

				➢ netacad.com/courses/quizzes
	Outcome: 3.3. Network Security **Competencies** 3.3.3. Devise account administration functions to support network security.	Describe tools used by threat actors to exploit networks.		
	Outcome: 3.4. Multilayer Defense Structure **Competencies** 3.4.1. Describe available systems for intrusion prevention, detection, and mitigation.	Describe malware types.		
	Outcome: 3.4. Multilayer Defense Structure **Competencies** 3.4.2. Analyze system log files to identify security risks.	Explain how TCP and UDP vulnerabilities are exploited by threat actors.		
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(145045) **Module 4**				
3 Days	**Strand 3. Information Security** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 3.3. Network Security **Competencies** 3.3.4. Describe Access Control Lists (ACLs) and explain why they are used.	Explain how ACLs filter traffic.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome: 3.3. Network Security **Competencies**	Explain how ACLs use wildcard masks.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/cou

	3.3.4. Describe Access Control Lists (ACLs) and explain why they are used.		➢ Project	rses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 3.3. Network Security **Competencies** 3.3.4. Describe Access Control Lists (ACLs) and explain why they are used.	Explain how to create ACLs.		
	Outcome: 3.3. Network Security **Outcome: 3.4. Multilayer Defense Structure** **Competencies** 3.3.4. Describe Access Control Lists (ACLs) and explain why they are used.	Compare standard and extended IPv4 ACLs.		

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Network Management (145045) **Module 5**				
3 Days	**Strand 3. Information Security** **Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.6. Configure and build a network.	Configure standard IPv4 ACLs to filter traffic to meet networking requirements.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.

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			➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	
	Outcome: 3.3. Network Security **Competencies** 3.3.4. Describe Access Control Lists (ACLs) and explain why they are used.	Use sequence numbers to edit existing standard IPv4 ACLs.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.6. Configure and build a network.	Configure a standard ACL to secure vty access.		
	Outcome: 4.1. Network Infrastructure	Configure extended IPv4 ACLs to filter traffic according to networking requirements.		

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	Competencies 4.1.6. Configure and build a network.			
Network Management (145045) **Module 6**				
4 Days	**Strand 2. IT Fundamentals** **Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 2.9. Project Concept Proposal **Competencies** 2.9.2. Determine the scope and	Explain the purpose and function of NAT.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They

	purpose of the project.		➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	will then be reassessed.
	Outcome: 2.9. Project Concept Proposal **Competencies** 2.9.1. Identify and incorporate branding strategies.	Explain the operation of different types of NAT.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 2.9. Project Concept Proposal **Competencies** 2.9.3. Determine the target audience, client needs, expected outcomes, objectives, and	Describe the advantages and disadvantages of NAT.		

	budget.			
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.6. Configure and build a network.	Configure static NAT using the CLI.		
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.6. Configure and build a network.	Configure dynamic NAT using the CLI.		
	Outcome: 4.1. Network Infrastructure **Competencies** 4.1.6. Configure and build a network.	Configure PAT using the CLI.		
	Outcome: 4.6. Network Protocols **Competencies** 4.6.1. Explain network protocols (e.g., Transmission Control	Describe NAT for IPv6.		

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	Protocol/Internet Protocol [TCP/IP], User Datagram Protocol [UDP], Internet Protocol Version 4 [IPv4], Internet Protocol Version 6 [IPv6]).			
Network Management (145045) **Module 7**				
3 Days	**Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 4.12. Wide Area Network **Competencies** 4.12.1. Select WAN connections (e.g., satellite, broadband, lease	Explain the purpose of a WAN.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be

	line, cellular, Multiprotocol Label Switching [MPLS], SD-WAN, Asynchronous Transfer Mode [ATM]). 4.12.4. Identify advantages to a software defined WAN (SD-WAN).		➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	reassessed.
	Outcome: 4.12. Wide Area Network **Competencies** 4.12.2. Describe point-to-point (PTP) and point-to-multipoint (PTMP) interconnection. 4.12.6. Determine the speed needed between sites to access applications.	Compare traditional WAN connectivity options.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 4.12. Wide Area Network **Competencies** 4.12.3. Evaluate and select basic	Compare modern WAN connectivity options.		

	telecommunications services (e.g., satellite, circuit switching, wireless, packet switching) and carriers for WAN requirements. 4.12.6. Determine the speed needed between sites to access applications.			
	Outcome 2.7. Web Architecture **Outcome: 4.12. Wide Area Network** **Competencies** 2.7.4. Identify how the use of different browsers and devices effects the look of a webpage (e.g., Americans with Disabilities Act [ADA]) . 2.7.6. Describe the characteristics and use of browser plug-ins**.** 4.12.6. Determine the speed needed between sites to access applications. 4.12.8. Evaluate and select transmission options.	Compare internet-based WAN connectivity options.		

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Network Management (145045) **Module 8**				
2 Days	**Strand 3. Information Security** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 3.1. Components of Information Security **Competencies** 3.1.4. Describe Virtual Private Networks (VPNs) using tunneling protocols (e.g., Layer 2 Tunneling Protocol [L2TP], Secure Socket Tunneling Protocol [SSTP], Point-to-Point Tunneling Protocol [PPTP] and encrypting techniques).	Describe benefits of VPN technology.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.

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	Outcome: 3.1. Components of Information Security **Competencies** 3.1.2. Compare authentication techniques (e.g., single factor, multifactor, passwords, biometrics, certificates, Radio Frequency Identification [RFID] cards).	Describe different types of VPNs	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 3.1. Components of Information Security **Competencies** 3.1.3. Compare methods of achieving information assurance and integrity and confidentiality (e.g., digital signatures, digital certifications, hashing algorithms, encryption).	Explain how the IPsec framework is used to secure network traffic.		
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Management (145045) **Module 9**				
3 Days	**Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 4.7. Transmission Control Protocol/Internet Protocol (TCP/IP) **Competencies** 4.7.1. Explain Fully Qualified Domain Names (FQDNs) and how they are used.	Explain how network transmission characteristics impact quality.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome: 4.10. Network Administration	Describe minimum network requirements for voice, video, and data traffic.	**Summative** ➢ Chap prac exam ➢ Chapter exam	**Helpful Resources within Netacad** ➢ netacad.com/cou

	Competencies 4.10.6. Establish shared network resources.		➢ Skills test ➢ Project	rses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 4.10. Network Administration **Competencies** 4.10.5. Create user accounts, groups, and login scripts.	Describe the queuing algorithms used by networking devices.		
	Outcome: 4.10. Network Administration **Competencies** 4.10.11. Explain the fundamentals of Quality of Service (QoS).	Describe the different QoS models.		

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		Explain how QoS uses mechanisms to ensure transmission quality.		
Network Management (145045) **Module 10**				
4 Days	**Strand 2. IT Fundamentals** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 2.10. Equipment **Competencies** 2.10.1. Identify hardware platforms, configurations, and support models.	Implement NTP between an NTP client and NTP server.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.

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			➢ Lab (real equipment)	
	Outcome: 2.10. Equipment **Competencies** 2.10.6. Monitor equipment operation and troubleshoot issues and problems.	Explain SNMP operation.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 2.10. Equipment **Competencies** 2.10.7. Backup, restore, test, archive, and manage data	Use commands to back up and restore an IOS configuration file.		
	Outcome 2.7. Web Architecture **Outcome: 2.10. Equipment**	Perform an upgrade of an IOS system image.		

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	Competencies 2.7.7. Compare the advantages and disadvantages of running an in-house server or using a service provider. 2.10.2. Identify processor, memory, storage, power and environmental requirements. . .			
	Outcome: 2.10. Equipment **Competencies** 2.10.9. Perform routine maintenance per manufacturer specifications.	Explain syslog operation.		
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3 Days	**Strand 2. IT Fundamentals** **Strand 4. Infrastructure Systems**			

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	ODE Standards: **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome 2.7. Web Architecture **Outcome: 2.10. Equipment** **Outcome: 4.1. Network Infrastructure** **Competencies** 2.7.5. Explain the relationship between data transmission volumes, bandwidth, and latency. 2.10.4. Identify software application requirements. 4.1.5. Describe how Unified Communication (UC) integrates voice, data, and video communications.	Explain how data, voice, and video are converged in a switched network.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome: 2.10. Equipment	Explain considerations for designing a scalable network.	**Summative** ➢ Chap prac exam	**Helpful Resources within Netacad**

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	Competencies 2.10.3. Identify architecture requirements.		➢ Chapter exam ➢ Skills test ➢ Project	➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 2.10. Equipment **Competencies** 2.10.2. Identify processor, memory, storage, power and environmental requirements.	Explain how switch hardware features support network requirements.		
	Outcome 2.7. Web Architecture **Outcome: 2.10. Equipment** **Competencies** 2.7.8. Describe the difference between static and dynamic sites	Describe the types of routers available for small to-mediumsized business networks.		

	and the reasons for using each. 2.10.1. Identify hardware platforms, configurations, and support models.			
Network Management (145045) **Module 12**				
4 Days	**Strand 2. IT Fundamentals** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 2.11. Troubleshooting **Competencies** 2.11.1. Identify the problem.	Explain how network documentation is developed and used to troubleshoot network issues.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.

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			➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	
	Outcome: 2.11. Troubleshooting **Competencies** 2.11.2. Select troubleshooting methodology (e.g., top down, bottom up, follow the path, spot the differences).	Compare troubleshooting methods that use a systematic, layered approach.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 2.11. Troubleshooting **Outcome: 4.9. Network Operating Systems** **Competencies** 2.11.3. Investigate symptoms based on the selected	Describe different networking troubleshooting tools.		

	methodology. 4.9.6. Install, test, and patch network Operating Systems manually and using automation.			
	Outcome: 2.11. Troubleshooting **Competencies** 2.11.4. Gather and analyze data about the problem. 2.11.8. Document the problem and the verified solution.	Determine the symptoms and causes of network problems using a layered model.		
	Outcome: 2.11. Troubleshooting **Competencies** 2.11.5. Design a solution. 2.11.6. Test a solution. 2.11.7. Implement a solution.	Troubleshoot a network using the layered model.		
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Module 13				
3 Days	**Strand 2. IT Fundamentals** **Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome 2.4. Emerging Technologies **Competencies** 2.4.3. Utilize cloud computing applications (e.g., services, applications, virtual environments).	Explain the importance of cloud computing.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome 2.4. Emerging Technologies	Explain the importance of virtualization.	**Summative** ➢ Chap prac exam ➢ Chapter exam	**Helpful Resources within Netacad** ➢ netacad.com/cou

	Outcome: 4.6. Network Protocols **Competencies** 2.4.1. Investigate the scope and the impact of mobile computing environments on society. 4.6.7. Describe a Virtual Private Network (VPN) and identify associated protocols (e.g., Layer 2 Tunneling Protocol [L2TP], Point-to-Point Tunneling Protocol [PPTP]).		➢ Skills test ➢ Project	rses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome 2.4. Emerging Technologies **Competencies** 2.4.4. Describe emerging technologies (e.g., Bring your Own Device [BYOD], Services Virtualization, Augmented Reality [AR], SMART Devices, Additive Manufacturing [3D Printing]).	Describe the virtualization of network devices and services.		
	Outcome: 2.10. Equipment **Competencies** 2.10.4. Identify software application requirements.	Describe software-defined networking.		

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	Outcome 2.4. Emerging Technologies **Competencies** 2.4.2. Describe the differences, advantages, and limitations of cloud computing (e.g., public cloud, private cloud, hybrid cloud) and on premises computing.	Describe controllers used in network programming.		
Network Management (145045) **Module 14**				
4 Days	**Strand 2. IT Fundamentals** **Strand 4. Infrastructure Systems** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			

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	Outcome 2.4. Emerging Technologies **Outcome: 4.9. Network Operating Systems** **Competencies** 4.9.4. Analyze the advantages and disadvantages of the client/server model. 2.4.4. Describe emerging technologies (e.g., Bring your Own Device [BYOD], Services Virtualization, Augmented Reality [AR], SMART Devices, Additive Manufacturing [3D Printing]).	Describe automation.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome 2.4. Emerging Technologies **Competencies** 2.4.1. Investigate the scope and the impact of mobile computing environments on society.	Compare JSON, YAML, and XML data formats.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedb

				ack ➢ netacad.com/courses/quizzes
	Outcome: 2.12. Performance Tests and Acceptance Plans **Competencies** 2.12.1. Create a written procedure agreed by the stakeholders and project team for determining the acceptability of the project deliverables.	Explain how APIs enable computer to computer communications.		
	Outcome: 2.12. Performance Tests and Acceptance Plans **Competencies** 2.12.2. Develop a test system that accurately mimics external interfaces.	Explain how REST enables computer to computer communications.		
	Outcome: 2.12. Performance Tests and Acceptance Plans **Competencies** 2.12.3. Develop test cases that are realistic, compare with expected performance, and include targeted platforms and device types.	Compare the configuration management tools Puppet, Chef, Ansible, and SaltStack		

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	Outcome: 2.12. Performance Tests and Acceptance Plans **Competencies** 2.12.4. Develop, perform, and document usability and testing integration.	Explain how Cisco DNA center enables intent-based networking.		
Network Management (145045) **Bridge**				
	Strand 2. IT Fundamentals **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 2.13. Rollout and Handoff	Students will learn to install, configure, and update commercial and open source network operating systems.	**Formative** ➢ Guided notes ➢ Online activities	Students that did not pass the summative assessment will study the feedback given

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	Outcome: 2.9. Project Concept Proposal **Competencies** 2.9.4. Develop a conceptual model and design brief for the project . 2.9.5. Develop a timeline, a communication plan, a task breakdown, costs (e.g., equipment, labor), deliverables, and responsibilities for completion 2.13.1. Include overall project goals and timelines in the rollout plan. 2.13.2. Communicate rollout plans to key stakeholders in a timely manner.		➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	by the summative assessment. They will then be reassessed.
	Outcome: 2.13. Rollout and Handoff **Competencies** 2.12.3. Conduct final review and approvals according to company standards. 2.13.4. Identify support staff, training needs, and contingency plans in the rollout plan.	This base of knowledge and skills may be applied across the career field.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback

	2.13.5. Test delivered application to assure that it is fully functional for the customer or user and meets all requirements.			➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 2.9. Project Concept Proposal **Outcome: 2.12. Performance Tests and Acceptance Plans** **Outcome: 2.13. Rollout and Handoff** **Competencies** 2.9.6. Develop and present a comprehensive proposal to stakeholders. 2.12.5. Make corrections indicated by test results. 2.12.6. Seek stakeholder acceptance upon successful completion of the test plan. 2.13.6. Deliver support and training materials.	Learners apply fundamental principles of IT, including the history of IT and its impact on society, common industry terms, systems theory, information storage and retrieval, database management, and computer hardware, software, and peripheral device configuration and installation.		
Network				

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LAKEWOOD CITY SCHOOLS



Security (145050) **Chapter 1**				
4 Days	**Strand 2. IT Fundamentals** **Strand 3. Information Security** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 2.1. Security, Risks, and Safeguards **Outcome: 3.5. Wireless Security** **Competencies** 2.1.3. Describe multilevel security. 3.5.1. Describe wireless security risks (e.g., unauthorized access) and how to mitigate them.	Describe the common characteristics comprising the cybersecurity world	**Pre-assessment** ➢ For SLO **Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.

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	Outcome: 2.1. Security, Risks, and Safeguards **Outcome: 3.5. Wireless Security** **Competencies** 2.1.4. Identify security risks and describe associated safeguards and methodologies (e.g., auditing). 3.5.2. Compare methods of increasing the security of wireless networks and devices (e.g., Media Access Control [MAC] address filtering, Wi-Fi Protected Access [WPA], 802.1x, Remote Authentication Dial In User Service [RADIUS]).	Differentiate the characteristics of cyber criminals and professionals	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 2.1. Security, Risks, and Safeguards **Outcome: 3.5. Wireless Security** **Competencies** 2.1.13. Describe privacy security compliance on systems (e.g., Health Insurance Portability and Accountability Act [HIPAA],	Compare how cybersecurity threats affect individuals, businesses, and organizations.		

	Payment Card Industry [PCI], Sarbanes Oxley Act [SOX], Americans with Disabilities Act [ADA], General Data Protection Regulation [GDPR], European Union Data Protection Regulation [EUDPR]). 3.5.5. Describe security practices and policies for personal devices.			
	Outcome: 2.1. Security, Risks, and Safeguards **Outcome: 3.5. Wireless Security** **Competencies** 2.1.9. Track and catalogue physical assets. 3.5.4. Describe practices and policies for preventing and detecting installation of rogue networks.	Describe the factors that lead to the spread and growth of cybercrime.		
	Outcome: 2.1. Security, Risks, and Safeguards **Outcome: 3.5. Wireless Security**	Describe the organizations and efforts committed to expanding the cybersecurity workforce.		

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	Competencies 2.1.8. Describe the need for security in application development. 3.5.3. Identify security enhancements provided by Institute of Electrical and Electronics Engineers (IEEE).			
Network Security (145050) **Chapter 2**				
4 Days	**Strand 3. Information Security** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 3.4. Multilayer Defense Structure	Describe the three dimensions of the McCumber Cube.	**Formative** ➢ Guided notes ➢ Online activities	Students that did not pass the summative assessment will study

	Competencies 3.4.1. Describe available systems for intrusion prevention, detection, and mitigation.		➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	the feedback given by the summative assessment. They will then be reassessed.
	Outcome: 3.2. General Security Compliance **Outcome: 3.4. Multilayer Defense Structure** **Competencies** 3.2.3. Describe and assign permissions (e.g., read-only, read-write**).** 3.4.2. Analyze system log files to identify security risks.	Describe the principles of confidentiality, integrity, and availability.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 3.4. Multilayer Defense Structure **Competencies**	Differentiate the three states of data.		

	3.4.3. Compare network analysis software (e.g., network analyzer) and hardware tools to identify security risks and vulnerabilities.			
	Outcome: 3.4. Multilayer Defense Structure **Competencies** 3.4.4 Identify the components of human security (e.g., social engineering) and techniques to mitigate human security threats (e.g., policies, procedures, training).	Compare the types of cybersecurity countermeasures.		
	Outcome: 3.4. Multilayer Defense Structure **Competencies** 3.4.1. Describe available systems for intrusion prevention, detection, and mitigation.	Describe the ISO Cybersecurity Model		
Network Security (145050)				

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Chapter 3				
3 Days	**Strand 2. IT Fundamentals** **Strand 3. Information Security** **Outcome: 4.6. Network Protocols** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 2.1. Security, Risks, and Safeguards **Outcome: 3.2. General Security Compliance** **Competencies** 2.1.5. Describe major threats to computer systems (e.g., insider threats, viruses, worms, spyware, ransomware, spoofing, hacking, social engineering, phishing). 3.2.5. Install, test, implement, and update virus and malware	Differentiate the types of malware and malicious code.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.

	detection and protection software. 3.2.6. Identify sources of virus and malware infection and remove viruses and malware.			
	Outcome: 3.4. Multilayer Defense Structure **Outcome: 4.6. Network Protocols Competencies** 3.4.4 Identify the components of human security (e.g., social engineering) and techniques to mitigate human security threats (e.g., policies, procedures, training). 4.6.8. Capture and analyze data packets.	Compare the different methods used in social engineering.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 3.2. General Security Compliance **Competencies** 3.2.5. Install, test, implement, and update virus and malware	Compare different types of cyberattacks.		

	detection and protection software.			
Network Security (145050) **Chapter 4**				
3 Days	**Strand 3. Information Security** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 3.2. General Security Compliance **Competencies** 3.2.1. Identify and implement data and application security. 3.2.4. Provide user authentication (e.g., assign and reset user accounts and	Explain how encryption techniques protect confidentiality.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.

	passwords).		➢ Packet tracer ➢ Lab (real equipment)	
	Outcome: 3.3. Network Security **Competencies** 3.3.4. Describe Access Control Lists (ACLs) and explain why they are used.	Describe how access control techniques protect confidentiality.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 3.3. Network Security **Competencies** 3.3.2. Identify security appliances and describe the role of each in a networked environment. 3.3.6. Describe the functions and uses of patch management.	Describe the concept of obscuring data.		

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Network Security (145050) **Chapter 5**				
3 Days	**Strand 3. Information Security** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 3.1.1 Components of Information Security **Competencies** 3.1.3. Compare methods of achieving information assurance and integrity and confidentiality (e.g. digital signatures, digital certifications, hashing algorithms, encryption).	Explain processes used to ensure integrity.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.

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	Outcome: 3.1.1 Components of Information Security **Competencies** 3.1.3. Compare methods of achieving information assurance and integrity and confidentiality (e.g. digital signatures, digital certifications, hashing algorithms, encryption).	Explain the purpose digital signatures.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 3.1.1 Components of Information Security **Competencies** 3.1.1. Differentiate between authentication and authorization.	Explain the purpose digital certificates.		
	Outcome: 3.1.1 Components of Information Security **Competencies** 3.1.5. Discuss the role of certificate authorities (CAs) and	Explain the need for database integrity enforcement.		

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	Public Key Infrastructure (PKI).			
Network Security (145050) **Chapter 6**				
3 Days	**Strand 3. Information Security** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 3.2. General Security Compliance **Competencies** 3.2.1. Identify and implement data and application security.	Explain the concept of high availability.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.

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			➢ Lab (real equipment)	
	Outcome: 3.2. General Security Compliance **Competencies** 3.2.2. Implement backup, restore, and verification procedures (e.g., tape, disk, cloud).	Explain how high availability measures are used to improve availability.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 3.2. General Security Compliance **Competencies** 3.2.7. Provide documentation, training, and support to users on established security procedures.	Describe how an incident response plan improves high availability.		
	Outcome: 3.2. General Security Compliance	Describe how disaster recovery planning plays an important role in implementing high availability.		

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	Competencies 3.2.8. Identify the need for disaster recovery policies and procedures.			
Network Security (145050) **Chapter 7**				
2 Days	**Strand 2. IT Fundamentals** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 2.1. Security, Risks, and Safeguards **Competencies** 2.1.2. Describe authentication, authorization, and auditing. 2.1.6. Describe the components of the physical environment (e.g.,	Explain how processes and procedures protect systems.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.

	wiring closets, server rooms) and physical security systems.		➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	
	Outcome: 2.1. Security, Risks, and Safeguards **Competencies** 2.1.7. Describe the need for security in networking (e.g., firewall, access controls, encryption, demilitarized zone). 2.1.13. Describe privacy security compliance on systems (e.g., Health Insurance Portability and Accountability Act [HIPAA], Payment Card Industry [PCI], Sarbanes Oxley Act [SOX], Americans with Disabilities Act [ADA], General Data Protection Regulation [GDPR], European Union Data Protection Regulation [EUDPR]).	Explain how to protect servers on a network.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome 2.7. Web Architecture **Competencies** 2.7.1. Describe methods of securely transmitting data. 2.7.2. Describe ways to present	Explain how to implement security measures to protect network devices.		

	data (e.g., responsive web design, mobile applications, desktop			
		Explain how physical security measures are implemented to protect network equipment.		
Network Security (145050) **Chapter 8**				
3 Days	**Strand 2. IT Fundamentals** **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8, RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8**			
	Outcome: 2.1. Security, Risks, and Safeguards **Competencies** 2.1.1. Explain the need for confidentiality, integrity, and	Describe how cybersecurity domains are used within the CIA triad.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be

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	availability (CIA) of information. 2.1.10. Describe computer forensics, its importance in information security and cybersecurity, and its relevance to law enforcement.		➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	reassessed.
	Outcome: 2.1. Security, Risks, and Safeguards **Competencies** 2.1.3. Describe multilevel security. 2.1.11. Identify the need for personal security in digital information and describe how personal information can be safeguarded.	Explain how ethics provide guidance.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/courses/quizzes
	Outcome: 2.1. Security, Risks, and Safeguards **Competencies** 2.1.10. Describe computer forensics, its importance in	Explain how to take the next step to become a cybersecurity professional		

	information security and cybersecurity, and its relevance to law enforcement. 2.1.12. Practice information security per job requirements.			
	Outcome: 2.1. Security, Risks, and Safeguards **Competencies** 2.1.8. Describe the need for security in application development.	Explain the purpose of laws related to cybersecurity.		
Network Security (145050) **Bridge**				
	Strand 4. Infrastructure Systems **ODE Standards:** **RH.11-12.1, RH.11-12.2, RH.11-12.3, RH.11-12.4, RH.11-12.5, RH.11-12.6, RH.11-12.7, RH.11-12.8, RH.11-12.9, RST.11-12.2, RST.11-12.3, RST.11-12.4, RST.11-12.5, RST.11-12.6, RST.11-12.7, RST.11-12.8,**			

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	RST.11-12.9, RST.11-12.10, WHST.11-12.1, WHST.11-12.6, WHST.11-12.7, WHST.11-12.8			
	Outcome: 4.13. Disaster Recovery **Competencies** 4.13.1. Differentiate between disaster recovery and business continuity. 4.13.2. Identify common backup devices.	Learners select components and mechanisms required for a multilayer defense structure and evaluate and minimize security risks to wired and wireless networks and devices.	**Formative** ➢ Guided notes ➢ Online activities ➢ Practice configs ➢ Presentations ➢ Class discussions ➢ Observation ➢ Handouts ➢ Exit tickets ➢ Quiz ➢ Packet tracer ➢ Lab (real equipment)	Students that did not pass the summative assessment will study the feedback given by the summative assessment. They will then be reassessed.
	Outcome: 4.13. Disaster Recovery **Competencies** 4.13.3. Identify the criteria for selecting a backup system. 4.13.4. Establish a process for archiving files. 4.13.5. Develop a disaster recovery plan.	Recommend disaster recovery and business continuity plans.	**Summative** ➢ Chap prac exam ➢ Chapter exam ➢ Skills test ➢ Project	**Helpful Resources within Netacad** ➢ netacad.com/courses/modules ➢ netacad.com/courses/pages/chapter-terms-and-concepts-practice ➢ netacad.com/courses/pages/student-resources ➢ assessment.netacad.net/virtuoso/personalized_feedback ➢ assessment.netacad.net/virtuoso//item_level_feedback ➢ netacad.com/cou

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				rses/quizzes