COURSE OUTLINE

Section 1:

Course Title: Cisco CCNA IV: Connecting Networks

Course Code: CNET-2011

Course Description: The study of Wide Area Networking (WAN) technologies required by converged applications on complex networks. Students explore the selection criteria of WAN technologies and network devices to meet business requirements. The learning outcomes of this course map to components of the Cisco Certified Network Associate (CCNA) certification.

Grade Scheme: ☐ Pass/Fail ☒ Percentage Minimum Pass Mark: 60%

Course Value: Outcome hours OR 3 Credit(s) 60 (15 class + 45 lab) Hours

Pre-requisites: CNET-2001 Cisco CCNA III: Scaling Networks

Co-requisites: NONE

Section 2:

Learning Outcomes and Competencies

1. **Analyze Wide Area Network (WAN) technologies required for enterprise networks.**
    - 1.1 Describe the major characteristics of WANs.
    - 1.2 Describe enterprise network architecture.
    - 1.3 Describe the operation of devices required for WAN connectivity.
    - 1.4 Differentiate among common WAN protocols.
    - 1.5 Describe common WAN services.
    - 1.6 Identify which layers of the OSI model WAN technologies operate.
    - 1.7 Determine the appropriate WAN technologies to meet enterprise business requirements.
2. **Implement Point-to-Point protocol (PPP) in a Wide Area Network.**
    - 2.1 Describe the fundamental concepts relating to point-to-point serial communications.
    - 2.2 Identify cable standards for serial communications.

2.3 Explain the layered architecture of PPP.

2.4 Identify the layers of the OSI model associated with PPP.

2.5 Compare and contrast PPP authentication protocols.

2.6 Configure PPP on Cisco routers for WAN connectivity.

2.7 Troubleshoot problems with PPP.

3. Implement Frame Relay in a Wide Area Network.

3.1 Describe Frame Relay terminology and operation.

3.2 Identify the layers of the OSI model associated with Frame Relay.

3.3 Configure basic Frame Relay on Cisco routers for WAN connectivity.

3.4 Configure Frame Relay subinterfaces, bandwidth, and flow control.

3.5 Troubleshoot Frame Relay problems.

4. Secure enterprise networks to protect enterprise resources.

4.1 Identify security threats to enterprise networks.

4.2 Describe methods to mitigate security threats.

4.3 Describe the required components of an enterprise security policy.

4.4 Secure routers to eliminate known vulnerabilities.

4.5 Configure secure remote access to routers.

4.6 Manage router files to ensure availability.

4.7 Use network management tools to investigate and correct security vulnerabilities.

5. Examine teleworker services required for secure remote access to enterprise networks.

5.1 Describe the business requirements for teleworker services.

5.2 Compare and contrast the different methods to connect teleworkers to the WAN.

5.3 Describe how virtual private networks (VPNs) provide secure teleworker services for an enterprise.

5.4 Describe the security features of VPNs.

5.5 Explain the operation of the IPsec security protocol and its use in VPNs.

6. Implement Network Address Translation to manage IP address usage.

6.1 Describe the advantages and disadvantages of network address translation.

6.2 Compare and contrast static and dynamic NAT.

6.3 Configure NAT on routers.

7. Manage networks to maintain performance and availability.

7.1 Document the network architecture.

7.2 Establish a network performance baseline.

7.3 Describe the common issues that occur in networks.

7.4 Use the layers of the OSI or TCP/IP model to troubleshoot network issues.

7.5 Use network monitoring and troubleshooting tools.

Section 3:

Assessment Categories:	Theory Tests and Exams	40%
	Practical Tests and Exams	25%
	Labs and Assignments	25%
	Professionalism	10%

Research Component? ☐ Yes ☒ No

Section 4:

(For administrative use only)

Is this course new? ☐ Yes ☒ No

Is this course replacing an existing course(s)? ☐ Yes ☒ No

If this course is replacing another, please record the name and code of the old course:

Course equivalents: NONE

Note: See Quality Procedure A01 for more details.

Catalog Year of Original Course Implementation: 2014

Catalog Year of Current Version Implementation: 2015

Revision level: 3 **Version:** 3 **Date:** June/2016 **Authorized by:** MLGJ

Accreditation and or Supporting Documents: National Technology Benchmarks: Canadian Council of Technicians & Technologists; Discipline: Information Technology; Level: Technologist

Additional Information: Additional tutorial hours may be scheduled.

Subject matter expert(s): Rob Blanchard

Approved by: (Program Manager)

Paul Murnaghan Date Approved: **2016-06-30**

Approved by: (Curriculum Consultant)

Mary Lou Griffin-Jenkins Date Approved: **2016-06-30**