COURSE OUTLINE

Section 1:

Course Title: Voice and Video Over Internet

Course Code: CNET-2040

Course Description: The exploration of how to configure, manage, and support Voice over IP (VoIP) systems. Students implement VoIP systems to ensure quality of service and to meet business requirements. Enterprise level routers and switches are configured to support VoIP over computer data networks.

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-1021 Cisco CCNA II: Routing and Switching Essentials

Co-requisites: NONE

Section 2:

Learning Outcomes and Competencies

1. **Explain basic telephony operation.**
   - 1.1 Describe the operation of the public switched telephone network (PSTN).
   - 1.2 Identify all components required by the PSTN.
   - 1.3 Compare how residential and business users connect to the PSTN.
   - 1.4 Describe the reasons for using a public branch exchange (PBX).
   - 1.5 Describe call signaling in analog telephony.
   - 1.6 Describe the various multiplexing techniques.
2. **Explain how packetized telephony networks aid network convergence.**
   - 2.1 Describe packet telephony.
   - 2.2 Describe the benefits of packet telephony compared to switched-circuit telephony.
   - 2.3 Describe how analog voice signals are quantized, sampled, and coded.

2.4 Describe the Nyquist Criteria and its consequence on sampling of analog signals.

2.5 Describe the factors that affect voice quality.

2.6 Identify the components of a packetized telephone network.

2.7 Describe the various call control techniques.

2.8 Compare and contrast real-time traffic such as voice and video to data traffic.

3. Explain technical requirements of voice over IP networks to ensure suitable quality.

3.1 Compare and contrast commonly used codecs for VoIP.

3.2 Describe the methods used to measure voice quality in VoIP.

3.3 Identify data network parameters that effect voice quality in VoIP.

3.4 Determine network bandwidth required to support call volume and voice quality.

3.5 Describe the role of voice gateways in VoIP networks.

3.6 Describe the major protocols used in VoIP networks including which layer of the OSI model they operate.

3.7 Describe the mechanisms for providing quality of service (QoS) in VoIP systems.

3.8 Compare and contrast approaches to increase reliability and availability to levels equivalent to corporate PBX systems.

4. Implement a VoIP system to meet business requirements.

4.1 Determine technical requirements of switches and routers to support VoIP.

4.2 Explain power over Ethernet and how it is used to power IP phones.

4.3 Determine costs to install and operate VoIP systems.

4.4 Install and configure switches and routers for basic VoIP functionality.

4.5 Implement various QoS mechanisms.

4.6 Perform traffic engineering for VoIP systems.

4.7 Enable calling features for IP phones.

4.8 Describe the equipment required to provide video conferencing capabilities.

4.9 Identify the systems required to provide unified messaging.

Section 3:

Assessment Categories:	Theory Tests and Exams	30%
	Labs and Assignments	30%
	Projects	30%
	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: 2011

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: None

Subject matter expert(s): Chris Arsenault

Approved by: (Program Manager)

Lornie Hughes Date Approved: **YYYY-MM-DD**

Approved by: (Curriculum Consultant)

Mary Lou Griffin-Jenkins Date Approved: **YYYY-MM-DD**