COURSE SYLLABUS

LAST REVIEW	Spring 2021
COURSE TITLE	Networking III
COURSE NUMBER	CIST-0216
DIVISION	Career and Technical Education
DEPARTMENT	CIST
CIP CODE	11.0901
CREDIT HOURS	4
CONTACT HOURS/WEEK	Class: 3 Lab: 2
PREREQUISITES	CIST-0158 Networking II
COREQUISITES	None

COURSE DESCRIPTION

This course examines how routers relay data on Wide Area Networks. It covers advanced configuration and troubleshooting of routers. The students will learn how to configure network (LAN) switching, virtual LANs, LAN Design, interior gateway routing protocol (IGRP), access control lists (ACL), Novell IPX, and network management. Students will have hands-on experience with a variety of network layouts in a lab environment equipped with multiple operating systems (Windows 95/98), Windows NT, and others). The course is designed to provide students with classroom and laboratory experience in current and emerging networking technology that will empower them to enter employment and/or further education and training in the computer networking field. Students will design and document a hypothetical network. This class uses the Cisco Academy Material, CCNA semester 3.

PROGRAM ALIGNMENT

This course is part of a program aligned through the Kansas Board of Regents and Technical Education Authority. For more information, please visit: https://kansasregents.org/workforce_development/program-alignment

PROGRAM LEARNING OUTCOMES

1. Intermediary devices: Configure and troubleshoot intermediary devices (switches and routers) efficiently and implement the basic security producer for LANs.
2. Wide Area Networks: Implement advanced configuration and troubleshooting of Wide Area Networks (WAN).

INSTITUTIONAL LEARNING OUTCOMES

☐ Communication

☐ Computation and Financial Literacy
☒ Critical Reasoning
☒ Technology and Information Literacy
☐ Community and Civic Responsibility
☐ Personal and Interpersonal Skills

TEXTBOOKS
http://kckccbookstore.com/

METHOD OF INSTRUCTION
A variety of instructional methods may be used depending on content area. These include but are not limited to lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE

I. Course Introduction
II. LAN Design
    A. Switched LAN Architecture
    B. Matching Switches to Specific LAN Functions
    C. Chapter Labs
III. Basic Switch Concepts and Configurations
    A. Introduction to Ethernet/802.3 Networks
    B. Forwarding Frames using a Switch
    C. Switch Management Configuration
    D. Configuring Switch Security
    E. Chapter Labs
IV. VLANs
    A. Introducing VLANS
    B. VLAN Trunking
    C. Configure VLANS and Trunks
    D. Troubleshooting VLANs and Trunks
    E. Chapter Labs
V. VTP
    A. VTP Concepts
    B. VTP Operation
    C. Configure VTP
    D. Chapter Labs
VI. STP
    A. Redundant Layer 2 Topologies
    B. Introduction to STP
    C. STP Convergence

D. PVST+, RSTP and Rapid-PVST+
E. Chapter Labs

VII. Inter-VLAN Routing
A. Inter-VLAN Routing
B. Configuring Inter-VLAN Routing
C. Troubleshooting Inter-VLAN Routing
D. Chapter Labs

VIII. Basic Wireless Concepts and Configurations
A. The Wireless LAN
B. Wireless LAN Security
C. Configure Wireless LAN Access
D. Troubleshooting Simple WLAN Problems
E. Chapter Labs

COURSE LEARNING OUTCOMES AND COMPETENCIES

Upon completion of the course, the student will:

A. Design a hierarchical network.
1. Describe how a hierarchical network supports the voice, video, and data needs of a small- or medium-sized business.
2. Describe the functions of each of the three levels of the hierarchical network design model, the principles of hierarchical network design (aggregate connectivity, network diameter, and redundancy), and the concept of a converged network.
3. Provide examples of how voice and video over IP affect network design.
4. Select appropriate devices to operate at each level of the hierarchy, including voice and video components.
5. Match the appropriate Cisco switch to each layer in the hierarchical network design model.

B. Enable basic switching.
6. Summarize the operation of ethernet as defined for 100/1000 MBPS LANs in the IEEE 802.3 standard.
7. Explain the functions that enable a switch to forward ethernet frames in a LAN.
8. Configure a switch for operation in a network designed to support voice, video, and data transmissions.
9. Configure basic security on a switch that will operate in a network designed to support voice, video, and data transmissions.

C. Set up working VLANs.
10. Explain the role of VLANs in a network.
11. Explain the role of trunking VLANs in a network.
12. Configure VLANs on the switches in a network topology.

13. Troubleshoot the common software or hardware configuration problems associated with VLANs on switches in a network topology.

D. Use VTP to manage VLANs.
14. Explain the role of VTP in a converged switched network.
15. Describe the operation of VTP including domains, modes, advertisements, and pruning.
16. Configure VTP on the switches in a converged network.

E. Eliminate switching loops with STP.
17. Explain the role of redundancy in a converged network.
18. Summarize how STP works to eliminate layer 2 loops in a converged network.
19. Explain how the STP algorithm uses three steps to converge on a loop-free topology.
20. Implement rapid PVST+ in a LAN to prevent loops between redundant switches.

F. Set up inter-VLAN communications.
21. Explain how network traffic is routed between VLANs in a converged network.
22. Configure inter-VLAN routing on a router to enable communication between end-user devices on separate VLANs.
23. Troubleshoot common inter-VLAN connectivity issues.

G. Build a secure wireless network.
24. Describe the components and basic operation of wireless LANs.
25. Describe the components and operations of basic WLAN security.
26. Configure and verify basic wireless LAN access.
27. Troubleshoot wireless client access.

H. Use employability skills.
28. Meet deadlines.

ASSESSMENT OF COURSE LEARNING OUTCOMES AND COMPETENCIES

Student progress is evaluated through both formative and summative assessment methods. Specific details may be found in the instructor's course information document.

COLLEGE POLICIES AND PROCEDURES

Student Handbook
https://www.kckcc.edu/files/docs/student-resources/student-handbook-and-code-of-conduct.pdf

College Catalog
https://www.kckcc.edu/academics/catalog/index.html

College Policies and Statements
https://www.kckcc.edu/about/policies-statements/index.html

Accessibility and Accommodations
https://www.kckcc.edu/academics/resources/student-accessibility-support-services/index.html.