SOUTHEAST COMMUNITY COLLEGE
CONSTRUCTION MANUFACTURING AND TECHNOLOGY DIVISION
Electronic Systems Technology Program
Revision Date: August 23, 2021

I. CATALOG DESCRIPTION

Course Number: ELEC2761
Course Title: Switching, Routing, and Wireless Essentials (SRWE)
Prerequisite(s):   ELEC2760
Catalog Description: CCNAv7: Switching, Routing, and Wireless Essentials (SRWE) covers the architecture, components, and operations of routers and switches in small networks and introduces wireless local area networks (WLAN) and security concepts. Students learn how to configure and troubleshoot routers and switches for advanced functionality using security best practices and resolve common issues with protocols in both IPv4 and IPv6 networks.
Credit Hours: 3
Class Hours: 38
Lab Hours: 23
Total Contact Hours: 61

II. COURSE OBJECTIVES: *Course will:*

A. Illustrate how to configure switches, VLAN configuration and router on a stick used in network configuration.
B. Compare STP and EtherChannel protocols
C. Compare standard and extended Access Control List (ACL).
D. Show how to configure DHCP on a router for a network.
E. Demonstrate how to configure NAT for IPV4 for a network.
F. Setup up IPv4 and IPv6 static routes on routers.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

A. Student Learning Outcomes: *Student will be able to:*
    1. Configure VLANs and Inter-VLAN routing applying security best practices.
    2. Troubleshoot inter-VLAN routing on Layer 3 devices.
    3. Configure redundancy on a switched network using STP and EtherChannel.
    4. Troubleshoot EtherChannel on switched networks.
    5. Explain how to support available and reliable networks using dynamic addressing and first-hop redundancy protocols.
    6. Configure dynamic address allocation in IPv6 networks.
    7. Configure WLANs using a WLC and L2 security best practices.
    8. Configure switch security to mitigate LAN attacks.
    9. Configure IPv4 and IPv6 static routing on routers.
B. General Education Learning Outcomes
    1. GELO #3: Critical Thinking & Problem Solving
        Outcome 1: Synthesize information to arrive at reasoned solutions to problems.

IV. CONTENT/TOPICAL OUTLINE

A. Basic Device Configuration
    1. Initial configuration setting for Switch and Router
    2. Remote access configuration

B. Switching Concepts
    1. Frame forwarding
    2. Collision and broadcast domains
C. VLANs
    1. Overview of VLANs
    2. VLAN configuration
    3. VLAN Trunks
    4. Dynamic Trunking Protocol
D. Inter-VLAN routing
    1. Router-on-a-Stick configuration
E. STP Concepts
    1. Purpose of STP
    2. Operation of STP
F. EtherChannel
    1. EtherChannel operation
    2. Configuration of PAgP and LACP
G. DHCPv4
    1. Concepts
    2. Configuration for DHCPv4
H. SLAAC and DHCPv6
    1. Concepts
    2. Configuration of SLAAC and DHCPv6
I. FHRP Concepts
    1. Introduction to First Hope Redundancy protocols
    2. HSRP
J. LAN Security Concepts
    1. End point security
    2. Access Control
    3. MAC Address table, and LAN Attacks
K. Switch Security Configurations
    1. Port Security
    2. Mitigate VLAN attacks
    3. Mitigate DHCP attacks
    4. Mitigate ARP attacks
    5. Mitigate STP Attacks
L. WLAN Concepts
    1. WLAN components
    2. WLAN operation
    3. CAPWAP Operation
    4. Channel Management
    5. WLAN threats and Seure WLANs
M. WLAN Configurations
    1. Remote Site WLAN configuration
    2. Basic WLAN on WLC configuration
    3. WPA2 enterprise WLAN on the WLC configuration
N. Routing Concepts
    1. How to read Routing table
    2. Path determination
    3. Static, Routing protocol and directly connect networks
O. IP Static Routing
    1. Static route configuration and troubleshooting

	2.	Default static routes
	3.	Floating static routes
	4.	Static host routes
P.	Troubleshoot Static and Default Routes	
	1.	Packet processing with Static routes
	2.	Troubleshooting static and default routes
Q.	Switching, Routing and Wireless Essentials Hands On and Written Final Exams	

V.   INSTRUCTIONAL MATERIALS
A.   Required Text(s): None, Curriculum available via Netacad.com

VI.   METHODS OF PRESENTATION/INSTRUCTION
A.   Methods of presentation typically include a combination of the following:
1.   Technology enhanced lecture
2.   Classroom discussion
3.   Interactive group activities
4.   Audio visual materials
5.   Presentation by experts for the Electronics and Networking industry
6.   Configuration and setting up network equipment both hardware and/or emulation software.

VII.   METHODS OF EVALUATION
A.   Methods of presentation, although determined by the individual instructor, traditionally includes a combination of the following:
1.   Attendance and participation
2.   Daily assignments
3.   Written exams and/or quizzes
4.   Performance and observational assessment

VIII.   SPECIFIC COURSE REQUIREMENTS
A.   Minimum grade of 60% is required.
B.   All student must pass Student Based Assessment (SBA or Lab Test) to receive a grade for the class, failure to complete SBA is automatic failing grade for class.
C.   Credit by Examination: Credit for the course CANNOT be earned through Credit by Examination.