EET-2303: CISCO II

Cuyahoga Community College

Viewing: EET-2303 : Cisco II

Board of Trustees:
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Academic Term:
Fall 2021

Subject Code
EET - Electrical/Electronic Engineer

Course Number:
2303

Title:
Cisco II

Catalog Description:
Covers the architecture, components, and operations of routers and switches in small networks. 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 Hour(s):
3

Lecture Hour(s):
2

Lab Hour(s):
2

Requisites

Prerequisite and Corequisite
EET-1303 Cisco I, or departmental approval: equivalent experience.

Outcomes

Course Outcome(s):
Configure and troubleshoot routers and switches for advanced functionality using security best practices and resolving protocol issues in Internet Protocol version 4 (IPv4) and Internet Protocol version 6 (IPv6).

Essential Learning Outcome Mapping:
Not Applicable: No Essential Learning Outcomes mapped. This course does not require application-level assignments that demonstrate mastery in any of the Essential Learning Outcomes.

Objective(s):
1. Configure virtual local area network (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.

Methods of Evaluation:

Evaluation can include any combination of the following:

1. Assignments
2. Quizzes
3. Exams
4. Lab Assignments
5. Projects
6. Reports
7. Oral Evaluations
8. Skills-based examinations

Course Content Outline:

1.Basic Device Configuration

A. Switch and switch ports

B. Secure Remote Management

C. Perform Basic Router Configurations

2.Switching Concepts

A. Frame Forwarding

B. Switching Domains, Collision vs Broadcasts

3.VLANs

A. The Purpose of VLANs

B.VLANs in a Multi-Switched Environment

C.VLANs Trunk Usage

D. What is a Dynamic Trunking Protocol (DTP)

4.Inter-VLAN Routing

A.Inter-VLAN Routing Operation

B.Router-on-a-Stick Inter-VLAN Routing

C. Inter-VLAN Routing using Layer 3 Switches

D. Troubleshoot Inter-VLAN Routing Problems

5.STP (Spanning Tree Protocol)

A. Purpose of The Spanning Tree Protocol (STP)

B. STP Operations

C. The evolution of STP

6.EtherChannel

A. EtherChannel Operation

B.EtherChannel Configuration

C.EtherChannel Trouble

7.Dynamic Host Configuration Protocol Version 4 (DHCPv4)

A.Dynamic Host Configuration Protocol Version 4 (DHCPv4) Concepts

B. DHCPv4 Server Configuration

C.DHCPv4 Client Configuration

8.SLAAC and DHCPv6 Concepts

A.Perform an IPv6 Global Unicast Address Assignment

B.The Operations of Stateless Address Auto Configuration (SLAAC)

C.Dynamic Host Configuration Protocol Version 6 (DHCPv6) Concepts

D.DHCPv6 Server Configuration

9.FHRP Concepts

A. First Hop Redundancy Protocol works

B. Hot Standby Router Protocol (HSRP) operates

10.LAN Security Concepts

A.Endpoint security to mitigate attacks

B.Explain how Authenticate Authorization and Accounting (AAA) and 802.1x are used

C.Identify Layer 2 vulnerabilities

D.Explain MAC Address Table Attacks
E.Explain how LAN attacks compromise LAN security
11.Switch Security Configuration
A.How to Implement Port Security
B.How to Mitigate VLAN Attacks
C.How to Mitigate DHCP Attacks
D.How to Mitigate Address Resolution Protocol (ARP) Attacks
E.How to Mitigate STP Attacks
12.WLAN Concepts
A.Introduction to Wireless
B.Components of WLANs
C.Describe WLAN Operation
D.Explain Control and Provisioning of Wireless Access Points (CAPWAP) Operations
E.Understand Channel Management in a wireless LAN
F.Describe what are threats to a WLAN and WLAN security mechanisms
13.WLAN Configuration
A.Define Remote Site WLAN Configurations
B.Configuring a Basic WLC on the WLC
C.Configuring a WiFi Protected Access 2 (WPA2) Enterprise WLAN on the WLC
D.Troubleshooting WLAN Issues
14.Routing Concepts
A.Routing Path determination
B.Describe Packet Forwarding
C.Basic Router Configuration review
D.Be able to interpret an IP Routing Table
E.Using Static and Dynamic Routing
15.IP Static Routing
A.Understanding the uses of Static Routes
B.Configuring IP Static Routes
C.Configuring IP Default Static Routes
D.Configuring Floating Static Routes
E.Configuring Static Host Routes
16.Troubleshoot Static and Default Routes
A.Understanding Packet Processing with Static Routes
B.Troubleshooting IPv4 Static and Default Route Configuration problems

Resources

Cisco Press. (2020) *Switching, Routing, and Wireless Essentials v7*, Indianapolis: Cisco Press.

Cisco Press. (2020) *Introduction to Networks v7*, Indianapolis: Cisco Press.

Cisco Press. (2020) *Enterprise Networking, Security, and Automation v7.*, Indianapolis: Cisco Press.

Top of page
Key: 4870