Course ID: CIMN 160
Cat ID: 433756.00
State ID: CCC000608658

College:	A	Saddleback College
Division/School:	BS	Business Science
Department:	CIM	Computer Information Management
Program:	CIMNAD	Network Administrator
Subject:	CIMNAD	Network Administrator

O F F I C I A L C O U R S E O U T L I N E

HISTORY AND STATUS

Course Status: A Active (Fully Approved)
Course Originator: Tom DeDonno

Board of Trustees	08/26/19
State Approval	02/26/07
Curriculum Committee Approval	07/24/19
Division Approval	07/24/19
Tech Review Approval	07/24/19

Technical Change Date: 03/05/01

Technical Change Comment:

3/5/01-taxonomy 2/25/13-fr CIM 297 to CIMN 260; 10/21/19 chng cb00 fr 501699 to 608658

Comments:

moe, assign, txt

BRIEF DESCRIPTION

Short Title: CISCO CCNA
Full Title: CISCO CCNA: ROUTING AND SWITCHING ESSENTIALS

BRIEF DESCRIPTION

Catalog Description:

Qualifies the student to take the Cisco CCNA exam.This course describes the architecture, components, and operations of routers and switches in a small network. Students learn how to configure a router and a switch for basic functionality. By the end of this course students will be able to configure and troubleshoot routers and switches and resolve common issues with RIPv1, RIPv2, single-area and multi-area OSPF, virtual LANs, and inter-VLAN routing in both IPv4 and IPv6 networks. Provides a firm foundation of Cisco's IOS, routing and protocols, layered communications, and WAN strategies. (Formerly CIMN 260).

Prerequisite:

None

Enrollment Limitation:

None

Corequisite:

None

Recommended Preparation:

None

COURSE FUNCTIONS

Course Prior to:	Y	Not Applicable
Course Classification:	Y	Credit Course
SC/IVC GE Code:	NA - Not Applicable	
CSU GE Code:	NA	Not Applicable
IGETC GE Code:	NA - Not Applicable	
UC Transferable Course:	N	No UC credit
Comparable SC/IVC:		
Comparable CSU:	CSU CSU Monterey Bay CST 284 - LAN and WAN Internetworking	
Comparable UC:		
Comparable CCC Baccalaureate:		
TOP Code:	0708.10	Network Administrator
SAM Code:	D	Possibly Occupational
CAN Number:		
CID Number:		

COURSE OPTIONS

Grading Option:	GR	Letter Grade or Pass/No Pass
Open Entry:	N	No
Fixed, Optional or Variable Units:	F	Fixed Units
Repeatability Status:	N	No
Repeatability Model:		
Repeatability Limit:	0	
Cross-Listed Courses:	NONE	
Cross-Listed Parent:	No	

COURSE VALUES

Method of Instruction:	L-L	Lecture/Lab Combination	
Maximum Enrollment:	45	Maximum WSCH:	225
Average Enrollment:	22	Average WSCH:	110

	Lecture	Lab	Learn Ctr	Total
WFCH	2.00	3.00	0.00	5.00
TFCH	33.20	49.80	0.00	83.00
TSCH	33.20	49.80	0.00	83.00
LHE	2.00	2.50	0.00	4.50
FTEF	13.33	16.67	0.00	30.00
UNITS	2.00	1.00	0.00	3.00

Schedule Description:

Qualifies the student to take the Cisco CCNA exam. Provides a firm foundation of Cisco's IOS, routing and protocols, layered communications, and WAN strategies. (Formerly CIMN 260).

COURSE CONTENT
(Topics Covered)

Lecture Topics:

I. Operating and configuring Cisco IOS devices
II. Managing your network environment
III. Configuring catalyst switch operations
IV. Extending switched networks with Virtual LANs (VLANs),
    A. Inter-VLAN routing
    B. Troubleshoot inter-VLAN routing
    C. Layer 3 Switching
    D. VLAN segmentation
    E. VLAN Implementation
    F. VLAN Security and Design

V. Determining Internet Protocol (IP) routes

VI. Managing IP traffic with access lists

    a. IP ACL Operations

    b. Standard IPv4 ACLs

    c. Extended IPv4 ACLSs

    d. Troubleshoot ACLs

    e. EPV6 ACLs

VII. Establishing serial point to point connections

VIII. Establishing frame relay connections

IX. Completing Integrated Services Digital Network (ISDN) calls

X. Introduction to Switched Networks

    a. LAN Design

    b. The Switched Environment

XI. Basic Switching Concepts and Configuration

    a. Basic Switch Configuration

    b. Switch Security Management and Implementation

XII. Routing Concepts

    a. Initial configuration of a Router

    b. Routing Decisions

    c. Router Operation

XIII. Static Routing

    a. Static Routing Implementation

    b. Configure Static Routing and Default Routes

    c. Review CIDR and VLSM

    d. Configure Summary and Floating Static Routes

e. Troubleshoot Static and Default Route Issues

XIV. Routing Dynamically

a. Dynamic Routing Protocols

b. Distance Vector Dynamic Routing

c. RIP and RIPng Routing

d. Link-State Dynamic Routing

e. The Routing Table

XV. Single-Area OSPF

a. Characteristics of OSPF

b. Configuring Single-Area OSPFv2

c. Configure Single-Area OSPFv3

XVI. DHCP

a. Dynamic Host Configuration Protocol v4

b. Dynamic Host Configuration Protocol v6

c. Network Address Translation for IPv4

d. Lectures on Lab topics

XVII. Network Address Translation (NAT) for IPv4

a. NAT Operation

b. Configuring NAT

c. Troubleshooting NAT

d. Lectures on Lab Topics

Lab/Learning Center Content:

I. Configure and verify static routing and default routing;
II. Configure and troubleshoot basic operations of routers in a small routed network including Routing Information Protocol (RIPv1 and RIPv2) and Open Shortest Path First (OSPF) protocol (single-area OSPF); Configure, monitor, and troubleshoot ACLs for IPv4 and IPv6;
III. Configure and troubleshoot NAT operations
IV. Configure and troubleshoot basic operations of a small switched network, VLANs, and inter-VLAN routing.
V. Configure Basic Switch Settings
VI. Configure Switch Security Features
VII. VLANs Labs
A. Configure VLANs and Trunking
B. Troubleshoot VLAN Configurations
C. Implement VLAN Security
VIII. Routing Concept Labs
A. Map the Internet
B. Configure Basic Router Settings with IOS CLI

C. Configure Basic Router Settings with CCP

IX. Inter-VLAN routing labs
- A. Configure Per-Interface Inter-VLAN Routing
- B. Configure 802.1Q Trunk-Based Inter-VLAN Routing
- C. Troubleshoot Inter-VLAN Routing

X. Static Routing Labs
- A. Configure IPv4 Static and Default Routes
- B. Configure IPv6 Static and Default Routes
- C. Design and Implement IPv4 Addressing with VLSM
- D. Calculate Summary Routes with IPv4 and IPv6
- E. Troubleshoot IPv4 and IPv6 Static Routes

XI. Configure Basic RIPv2 and RIPng

XII. Single Area OSPF Labs
- A. Configure Basic Single-Area OSPFv2
- B. Configure Basic Single-Area OSPFv3

XIII. Access Control Lists (ACLs) Labs
- A. Configure and Verify Standard ACLs
- B. Configure and Verify VTY Restrictions
- C. Configure and Verify Extended ACLs
- D. Troubleshoot ACL Configuration and Placement
- E. Configure and Verify IPv6 ACLs

XIV. DHCP Labs
- A. Configure Basic DHCPv4 on a Router
- B. Configure Basic DHCPv4 on a Switch
- C. Troubleshoot DHCPv4
- D. Configure Stateless and Stateful DHCPv6
- E. Troubleshoot DHCPv6

XV. NAT Labs
- A. Configure Dynamic and Static NAT
- B. Configure NAT Pool Overload and PAT
- C. Troubleshoot NAT Configurations

COURSE CONTENT
(Learning Objectives)

Students participating in this class will:

1. Describe basic switching concepts, how VLANs create logically separate networks and how routing occurs between them, and enhanced switching technologies such as VLANs, VLAN Trunking Protocol (VTP), Rapid Spanning Tree Protocol (RSTP), Per VLAN Spanning Tree Protocol (PVSTP), and 802.1
2. Configure and troubleshoot basic operations of a small switched network, VLANs, and inter-VLAN routing. Class will specifically use Cisco IOS commands to configure VLANs, VTP, IEEE 802.1Q trunking, and ISL trunking, given a functioning access layer switch.
3. Understand and describe the purpose, nature, and operations of a router, routing tables, and the route lookup process, dynamic routing protocols, distance vector routing protocols, and link-state routing protocols, the purpose and types of access control lists (ACLs), and and the operations and benefits of Dynamic Host Configuration Protocol (DHCP), Domain Name System (DNS) for IPv4 and IPv6, and Network Address Translation (NAT).
4. Describe the features and operation of static and dynamic routing, including RIPv1 and RIPv2, IGRP, EIGRP, and Open Shortest Path First (OSPF) protocol (single-area OSPF); Configure, monitor, and troubleshoot ACLs for IPv4 and IPv6; and configure and troubleshoot NAT operations.
5. Use the available configuration tools to establish connectivity to the appropriate network device in order to complete the initial device configuration.
6. Execute an Add, Move, or Change so that the network functions in accordance with the new requirement, given a new network requirement.
7. Use the command-line interface to accurately determine network operational status and network performance.
8. Build a functional access switch configuration to support the specified network operational parameters, given a network design.
9. Use show and debug commands to identify anomalies in VLAN, VTP, ISL trunking, and Spanning-Tree operations, given an operational access layer switch.
10. Use show and debug commands to identify anomalies in routing operations, given an operational access layer switch.
11. Use Cisco IOS commands to configure standard and extended access lists, given a functioning router.
12. Use Cisco IOS commands to configure serial interfaces using HDLC and PPP encapsulation for leased line connections, given a functioning router.

COURSE CONTENT
(Student Learning Outcomes)

Students completing this course satisfactorily will be able to:

1. Describe the purpose and functions of various network devices
2. Select the components required for network and Internet communications
3. Illustrate the operation and benefits of using DHCP and DNS

COURSE CONTENT
(Methods of Evaluation)

Evaluation of the student will be based upon the following items:

1. Writing Assignments
   short answers
   other (specify)
   a. Students will be assessed on their ability to evaluate, synthesize, use, and communicate information in its various formats and apply them to solving connectivity issues in written reports.

2. Problem Solving Demonstrations
   quizzes
   other (specify)
   a. Students will be assessed on their ability to identify and troubleshoot existing configurations of Cisco switches and routers.

3. Skill Demonstrations
   class performance(s)
   other (specify)
   a. Students will be assessed on their ability to demonstrate proficiency in programming Cisco switches and routers for various connectivity configurations.

4. Examinations
   multiple choice, true/false
   other (specify)
   a. Students will be evaluated for their understanding of Cisco's Internetworking Operating System and Protocols in written examinations.

5. Other
   other (specify)
   a. Students will be evaluated for their participation in class discussions and presentations.

COURSE CONTENT
(In and Out-of-Class Assignments)

1. Typical Reading Assignments:
   Students will be expected to understand and critique college level technical documents or the equivalent. Reading assignments may include but are not limited to the following:

   a. Assigned Computer-Based courseware
   b. Technical papers
   c. Technical Web sites

2. Typical Writing Assignments:
   Writing assignments will pertain directly to the course topics and may include but are not limited to the following:

   a. Examinations and quizzes
   b. Exercises and problem simulations

3. Typical Oral Assignments:
   Class discussions

COURSE CONTENT
(Other Requirements)

Textbooks / Supplies:
Testout, Routing and Switching Pro, Testout. 2016
Cisco Academy Program, Routing and Switching Essentials v6 Course Booklet , 1st Edition Ed. Cisco Press. 2016
Lammie, T.,, CCENT ICND1 Study Guide: Exam 100-105 3rd Edition, 3rd Ed. Sybex. 2016

Material Fees: $ 0.00 Transaction Code:

VALIDATION
(Corequisite, Limitation on Enrollment,
Prerequisite and Recommended Preparation)