Las Positas College
3000 Campus Hill Drive
Livermore, CA 94551-7650
(925) 424-1000
(925) 443-0742 (Fax)

Course Outline for CNT 8003

CISCO CCNA3 SCALING NETWORKS

Effective: Fall 2018

I. CATALOG DESCRIPTION:
CNT 8003 — CISCO CCNA3 SCALING NETWORKS — 3.00 units

Architecture, components, and operations of routers and switches in large and complex networks. Configuring routers and switches for advanced functionality. Configuring and troubleshooting routers and switches and resolving common issues with OSPF, EIGRP, and STP in both IPv4 and IPv6 networks. Developing the knowledge and skills needed to implement a WLAN in a small-to-medium network. Preparation for Cisco certification examination.

2.50 Units Lecture 0.50 Units Lab

Prerequisite
CNT 8002 - Routing and Switching Essentials (CCNA2)
with a minimum grade of C

Grading Methods:
Letter or P/NP

Discipline:
- Computer Service Technology

	MIN
Lecture Hours:	45.00
Expected Outside of Class Hours:	90.00
Lab Hours:	27.00
Total Hours:	162.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. PREREQUISITE AND/OR ADVISORY SKILLS:
Before entering the course a student should be able to:

A. CNT8002
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 802.1q
2. configure and troubleshoot basic operations of a small switched network, VLANs, and inter-VLAN routing;
3. 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 the operations and benefits of Dynamic Host Configuration Protocol (DHCP), Domain Name System (DNS) for IPv4 and IPv6, and Network Address Translation (NAT)
4. configure and verify static routing and default routing
5. 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)
6. Configure, monitor, and troubleshoot ACLs for IPv4 and IPv6; and configure and troubleshoot NAT operations

IV. MEASURABLE OBJECTIVES:
Upon completion of this course, the student should be able to:

A. Configure and troubleshoot enhanced switching technologies such as VLANs, Rapid Spanning Tree Protocol (RSTP), Per VLAN Spanning Tree Plus Protocol (PVST+), and EtherChannel
B. Configure and troubleshoot first hop redundancy protocols (HSRP) in a switched network
C. Configure and troubleshoot wireless routers and wireless clients
D. Configure and troubleshoot routers in a complex routed IPv4 or IPv6 network using single-area OSPF, multiarea OSPF, and Enhanced Interior Gateway Routing Protocol (EIGRP)
E. Manage Cisco IOS® Software licensing and configuration files

V. CONTENT:
A. Introduction to Scaling Networks

1. Implementing a Network Design
2. Selecting Network Devices

B. LAN Redundancy
1. Spanning Tree Concepts
2. Varieties of Spanning Tree Protocols
3. Spanning Tree Configuration
4. First-Hop Redundancy Protocols

C. Link Aggregation
1. Link Aggregation Concepts
2. Link Aggregation Configuration

D. Wireless LANs
1. Wireless LAN Concepts
2. Wireless LAN Operation
3. Wireless LAN Security
4. Wireless LAN Configuration

E. Adjust and Troubleshoot Single-Area OSPF
1. Advanced Single-Area OSPF Configurations
2. Troubleshooting Single-Area OSPF Implementations

F. Multiarea OSPF
1. Multiarea OSPF Operation
2. Configuring Multiarea OSPF

G. EIGRP
1. Characteristics of EIGRP
2. Configuring EIGRP for IPv4
3. Operation of EIGRP
4. Configuring EIGRP for IPv6

H. EIGRP Advanced Configurations and Troubleshooting
1. Advanced EIGRP Configurations
2. Troubleshoot EIGRP

I. IOS Images and Licensing
1. Managing IOS System Files
2. IOS Licensing

VI. METHODS OF INSTRUCTION:

A. **Lecture** -
B. **Lab** -
C. **Discussion** -
D. **Demonstration** -

VII. TYPICAL ASSIGNMENTS:

A. OSPF Protocol
1. Using Packet Tracer simulation software, build a topology consisting of routers, three switches, and three computers. Install, configure, verify connectivity and troubleshoot the OSPF protocol.

B. Switches and VLANs
1. Build a network consisting of three switches and three Ethernet networks. Create two separate virtual LANs and demonstrate connectivity from end devices to opposite end devices.

VIII. EVALUATION:

A. **Methods**

1. Exams/Tests
2. Quizzes
3. Simulation
4. Class Participation
5. Home Work
6. Lab Activities

B. **Frequency**

1. Exams/Tests - one exam and one final.
2. Quizzes - weekly
3. Simulations - weekly
4. Class participation - weekly
5. Homework - weekly
6. Lab Activities - weekly

IX. TYPICAL TEXTS:

1. Odom, Wendell . *CCNA Routing and Switching ICND2 200-105 Official Cert Guide.* 1st ed., Cisco Press, 2016.
2. Cisco Networking Academy. *Scaling Networks Companion Guide.* 2nd ed., Cisco Press, 2017.
3. Cisco Networking Academy on-line curriculum.

X. OTHER MATERIALS REQUIRED OF STUDENTS: