

Course Outline for CNT 72
CISCO BOOTCAMP CERTIFICATION PREP
Effective: Fall 2018

I. CATALOG DESCRIPTION:

CNT 72 — CISCO BOOTCAMP CERTIFICATION PREP — 2.00 units

This course covers preparation for the Cisco certification exams CCENT (Cisco Certified Entry-level Network Technician) and CCNA (Cisco Certified Networking Associate) exams. All Cisco certification exam objectives are covered conceptually, practically and specifically as they relate to the exam. Effective troubleshooting and Cisco recommended methods and nomenclature are reviewed and practiced. Topics include: basic characteristics of Ethernet networks, LANs and WANs, Cisco router and switch configuration and IOS, RIP, OSPF, IGRP and EIGRP routing protocols, PPP, ISDN and Frame Relay concepts and configuration, IP network addressing, Switching, VLANs, VLSM, CIDR and network troubleshooting using Cisco methods and router and switch commands, and certification test methods, practice and preparation.

1.50 Units Lecture 0.50 Units Lab

Strongly Recommended

CNT 8001 - Introduction to Networks (CCNA1)
with a minimum grade of C

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

-

Grading Methods:

Letter or P/NP

Discipline:

- Computer Service Technology

| | MIN |
|---|------------|
| Lecture Hours: | 27.00 |
| Expected Outside of Class Hours: | 54.00 |
| Lab Hours: | 27.00 |
| Total Hours: | 108.00 |

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

III. PREREQUISITE AND/OR ADVISORY SKILLS:

Before entering this course, it is strongly recommended that the student should be able to:

A. CNT8001

1. describe and differentiate the devices and services used to support communications in data networks and the Internet;
2. describe the role of protocol layers in data networks;
3. evaluate the importance of addressing and naming schemes at various layers of data networks in IPv4 and IPv6 environments;
4. design, calculate, and apply subnet masks and addresses to fulfill given requirements in IPv4 and IPv6 networks;
5. explain fundamental Ethernet concepts such as media, services, and operations;
6. build a simple Ethernet network using routers and switches;
7. compose Cisco command-line interface (CLI) commands to perform basic router and switch configurations;
8. experiment with common network utilities to verify small network operations and analyze data traffic.

B. 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

IV. MEASURABLE OBJECTIVES:

Upon completion of this course, the student should be able to:

- A. Demonstrate the steps of network design and configuration
- B. Describe primary types of network media
- C. Determine the correct IP numbering for a network system
- D. Assemble Cisco routers and switches into a working internetwork
- E. Describe the process of analyzing network problems to determine, test, and implement a solution using Cisco methodology
- F. Describe the concepts and characteristics of ethernet networks
- G. Configure and troubleshoot ISDN and Frame Relay links
- H. Describe the OSI model and the functions of each layer
 - I. Create a router configuration using multiple routing protocols
 - J. Identify network problems using debug and show commands
- K. Create an IP addressing scheme using VLSM and CIDR
- L. Configure Cisco routers and switches for LAN and WAN connectivity
- M. Utilize access control lists to control traffic

V. CONTENT:

- A. Operation of data networks.
 - 1. Purpose and functions of various network devices
 - 2. Select the components required to meet a given network specification
 - 3. Use the OSI and TCP/IP models and their associated protocols to explain how data flows in a network
 - 4. Common networking applications including web applications
 - 5. Purpose and basic operation of the protocols in the OSI and TCP models
 - 6. Impact of applications (Voice Over IP and Video Over IP) on a network
 - 7. Interpret network diagrams
 - 8. Determine the path between two hosts across a network
 - 9. Describe the components required for network and Internet communications
 - 10. Identify and correct common network problems at layers 1, 2, 3 and 7 using a layered model approach
 - 11. LAN/WAN operation and features
- B. Switched network
 - 1. Select the appropriate media, cables, ports, and connectors to connect switches to other network devices and hosts
 - 2. Technology and media access control method for Ethernet technologies
 - 3. Network segmentation and basic traffic management concepts
 - 4. Operation of Cisco switches and basic switching concepts
 - 5. Perform, save and verify initial switch configuration tasks including remote access management
 - 6. Verify network status and switch operation using basic utilities (including: ping, traceroute, telnet, SSH, arp, ipconfig), SHOW & DEBUG commands
 - 7. Implement and verify basic security for a switch (port security, deactivate ports)
 - 8. Identify, prescribe, and resolve common switched network media issues, configuration issues, autonegotiation, and switch hardware failures
- C. IP addressing and IP services
 - 1. Need and role of addressing in a network
 - 2. Create and apply an addressing scheme to a network
 - 3. Assign and verify valid IP addresses to hosts, servers, and networking devices in a LAN environment
 - 4. Basic uses and operation of NAT in a small network connecting to zone ISP
 - 5. DNS operation
 - 6. Operation and benefits of using private and public IP addressing
 - 7. Enable NAT for a small network with a single ISP and connection and verify operation using CLI and ping
 - 8. Configure, verify and troubleshoot DHCP and DNS operation on a router.
 - 9. Implement static and dynamic addressing services for hosts in a LAN environment
 - 10. Identify and correct IP addressing issues
- D. Routed network
 - 1. Basic routing concepts (including: packet forwarding, router lookup process)
 - 2. Operation of Cisco routers (including: router bootup process, POST, router components)
 - 3. Select the appropriate media, cables, ports, and connectors to connect routers to other network devices and hosts
 - 4. Configure, verify, and troubleshoot RIPv2
 - 5. Access and utilize the router CLI to set basic parameters
 - 6. Connect, configure, and verify operation status of a device interface
 - 7. Verify device configuration and network connectivity using ping, traceroute, telnet, SSH or other utilities
 - 8. Perform and verify routing configuration tasks for a static or default route given specific routing requirements
 - 9. Manage IOS configuration files (including: save, edit, upgrade, restore)
 - 10. Manage Cisco IOS
 - 11. Implement password and physical security
 - 12. Verify network status and router operation using basic utilities (including: ping, traceroute, telnet, SSH, arp, ipconfig), SHOW & DEBUG commands
- E. Appropriate administrative tasks required for a WLAN
 - 1. Standards associated with wireless media (including: IEEE Wi-Fi Alliance, ITU/FCC)
 - 2. Purpose of the components in a small wireless network. (including: SSID, BSS, ESS)
 - 3. Identify the basic parameters to configure on a wireless network to ensure that devices connect to the correct access point
 - 4. Compare and contrast wireless security features and capabilities of WPA security (including: open, WEP, WPA-1/2)
 - 5. Identify common issues with implementing wireless networks
- F. Security threats to a network and general methods to mitigate those threats
 - 1. Today's increasing network security threats and the need to implement a comprehensive security policy to mitigate the threats
 - 2. General methods to mitigate common security threats to network devices, hosts, and applications
 - 3. Functions of common security appliances and applications
 - 4. Security recommended practices including initial steps to secure network devices
- G. WAN Design
 - 1. Implement and verify WAN links
 - 2. Different methods for connecting to a WAN
 - 3. Configure and verify a basic WAN serial connection

VI. METHODS OF INSTRUCTION:

- A. **Lecture** -
- B. **Discussion** - Discussion of concepts and skills
- C. Read texts and other sources
- D. **Lab** - Laboratory experience: hands-on lab projects with routers and switches
- E. **Demonstration** - Computer demonstrations with overhead display panel
- F. Hands-on explanation utilizing routers, switches and computers
- G. **Audio-visual Activity** - Powerpoint presentations and online resources

VII. TYPICAL ASSIGNMENTS:

- A. Reading Assignments
 - 1. Online supporting webpages pertaining to the operation and implementation of data networks: LANs, WANs, and WLANs, and the security threats to a network.
- B. Hands-on lab assignments
 - 1. Using the LPC Cisco lab equipment and the BACCC NETLAB, to develop skills implementing a small switched networked, a small routed network, and an IP addressing scheme and IP services to meet network requirements for a small branch office.
 - 2. Troubleshooting non-expected outcomes.

VIII. EVALUATION:

A. **Methods**

- 1. Exams/Tests
- 2. Quizzes
- 3. Class Participation
- 4. Lab Activities
- 5. Class Performance

B. **Frequency**

- 1. Weekly lab assignments and comprehensive module quizzes to develop and demonstrate understanding, problem solving and troubleshooting skills
- 2. The final comprehensive exam and the skills-based assessment will be administered during the final week of class.
- 3. Daily class performance and participation

IX. TYPICAL TEXTS:

- 1. Odem, Wendell. *CCENT/CCNA ICND1 100-105 Official Cert Guide*. 2nd Edition ed., Cisco Press; Prentice Hall, 2016.
- 2. Lammle, Todd . *CCNA Routing and Switching Complete Study Guide: Exam 100-105, Exam 200-105, Exam 200-125*. 2nd ed., Sybex, 2016.
- 3. Empson , Scott . *CCNA Routing and Switching Portable Command Guide (ICND1 100-105, ICND2 200-105, and CCNA 200-125)*. 4th ed., Cisco Press, 2016.

X. OTHER MATERIALS REQUIRED OF STUDENTS: