

OHLONE COLLEGE
Ohlone Community College District
OFFICIAL COURSE OUTLINE

I. Description of Course:

1. **Department/Course:** CNET - 154
2. **Title:** Network Technician Training
3. **Cross Reference:**
4. **Units:** 4
Lec Hrs: 3
Lab Hrs: 3
Tot Hrs: 108.00
5. **Repeatability:** Yes Times:3
6. **Grade Options:** Letter Grade, May
Petition for Pass/No Pass (GP)

7. **Degree/Applicability:**
Credit, Degree Applicable, Transferable
- CSU & UC (T)
8. **General Education:**
9. **Field Trips:** Not Required
10. **Requisites:**

12. Catalog Description:

This course prepares student's for the knowledge and skills required to successfully install, operate, and troubleshoot a small branch office network. The class includes topics on networking fundamentals; connecting to a WAN; basic security and wireless concepts; routing and switching fundamentals; the TCP/IP and OSI models; IP addressing; WAN technologies; operating and configuring IOS devices; configuring RIPv2, static and default routing; implementing NAT and DHCP; and configuring simple networks.

13. Class Schedule Description:

Network Technician training and preparation for CCENT certification.

14. Counselor Information:

CCENT stands for Cisco Certified Entry-level Network Technician. High school students from schools teaching the Cisco Academy Discovery 1 and 2 courses would be able to qualify for credit for this course if they successfully passed the high school course.

II. Student Learning Outcomes

The student will:

1. Describe the operation of data and converged networks.
2. Implement a small switched network.
3. Implement an IP addressing scheme and IP services to meet network requirements for a small branch office.
4. Implement a small routed network.
5. Explain and select the appropriate administrative tasks required for a WLAN (Wireless Local Area Network).
6. Identify security threats to a network and describe and apply general methods to mitigate those threats.
7. Implement and verify WAN (Wide Area Network) links.

III. Course Outline:

A. Describe the operation of data networks.

1. Describe the 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. Describe common networking applications including web applications
5. Describe the purpose and basic operation of the protocols in the OSI and TCP models
6. Describe the 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. Differentiate between LAN/WAN operation and features

B. Implement a small switched network

1. Select the appropriate media, cables, ports, and connectors to connect switches to other network devices and hosts
2. Explain the technology and media access control method for Ethernet technologies
3. Explain network segmentation and basic traffic management concepts
4. Explain the 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, describe, and resolve common switched network media issues, configuration issues, autonegotiation, and switch hardware failures

C. Implement an IP addressing scheme and IP services to meet network requirements for a small branch office

1. Describe the 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. Explain the basic uses and operation of NAT in a small network connecting to one ISP
5. Describe and verify DNS operation
6. Describe the operation and benefits of using private and public IP addressing
7. Enable NAT for a small network with a single ISP and connection using SDM and verify operation using CLI and ping
8. Configure, verify and troubleshoot DHCP and DNS operation on a router.(including: CLI/SDM)
9. Implement static and dynamic addressing services for hosts in a LAN environment
Identify and correct IP addressing issues

D. Implement a small routed network

1. Describe basic routing concepts (including: packet forwarding, router lookup process)
 2. Describe the 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. Explain and select the appropriate administrative tasks required for a WLAN
1. Describe standards associated with wireless media (including: IEEE WI-FI Alliance, ITU/FCC)
 2. Identify and describe the 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
 6. Identify security threats to a network and describe general methods to mitigate those threats
 7. Explain today's increasing network security threats and the need to implement a comprehensive security policy to mitigate the threats
 8. Explain general methods to mitigate common security threats to network devices, hosts, and applications
 9. Describe the functions of common security appliances and applications
 10. Describe security recommended practices including initial steps to secure network devices
- F. Implement and verify WAN links
1. Describe different methods for connecting to a WAN
 2. Configure and verify a basic WAN serial connection

IV. **Course Assignments:**

A. Reading Assignments

1. Readings in the online curriculum, supporting web pages, and the textbook.

B. Projects, Activities, and other Assignments

1. Hands-on lab assignments in the Cisco computer lab.
2. Troubleshooting non-expected outcomes.

C. Writing Assignments

1. Worksheets
2. Lab Report(s)

V. Methods of Evaluation/Assessment:

- A. Multiple Choice, True/False, and Fill-in objective quizzes and exams to test conceptual understanding of networking essentials, networking technology, IP addressing and routing.
- B. Skills-based assessment.

VI. Methods of Instruction:

- A. Lecture
- B. Laboratory
- C. Demonstration
- D. Other
 1. Web-enhanced

VII. Textbooks:

Recommended

Supplemental

- A. Allan Reid, Jim Lorenz *Networking for Home and Small Businesses, CCNA Discovery Learning Guide* 1st Edition, Cisco Press - Companion Guide, 2008 ISBN: 10: 1-58713-209
- B. Allan Reid, Jim Lorenz *Working at a Small-to-Medium Business or ISP, CCNA Discovery Learning Guide* 1st Edition, Cisco Press - Companion Guide, 2008 ISBN: 10: 1-58713-210

VIII. Supplies: