COURSE OUTLINE

CSCO-650
Building Scalable Cisco Networks
3 Semester Hours

HOWARD COMMUNITY COLLEGE

Description

This course focuses on advanced routing using Cisco routers connected in local-area networks (LANs) and wide-area networks (WANs) typically found at medium to large network sites. Upon completion of this course, the student will be able to select and implement the appropriate Cisco IOS services required to build a scalable routed network. This course will help the student prepare for exams associated with CCNP (Cisco Certified Network Professional) certification (640-503). Prerequisite: CSCO-272 or CCNA certification. (2 hours lecture, 3 hours lab)

Overall Course Objectives

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

1. Describe the key requirements of a scalable network.
2. List the key information routers need to route data.
3. Describe classful and classless routing protocols.
4. Given an Internet Protocol (IP) address range, use Variable-Length Subnet Masks (VLSMs) to extend the use of the IP addresses.
5. Configure and verify how OSPF works in a single area.
6. Describe the issues with interconnecting multiple areas and how OSPF addresses each.
7. Explain how EIGRP discovers, chooses, and maintains routes.
8. Describe how EIGRP supports large networks.
9. Describe BGP features and operation.
10. Describe the function of access lists.
11. Configure policy-based routing using route maps.
12. Configure an IP helper address to manage broadcasts.
13. Explain IP private addresses and Network Address Translation (NAT).
14. Explain reflexive, context-based and dynamic access list types.

Major Topics

I. Hierarchical Network Design Model and Key characteristics of Scalable Networks
   - A. Three-layer hierarchical internet
   - B. Examples of Cisco routers at each layer
   - C. List of scalable internetwork characteristics

II. Variable Length Subnet Masks (VLSM) and Private IP addresses and NAT, Easy IP/DHCP
   - A. Calculating VLSM and VLSM examples
   - B. NAT implementation considerations
   - C. Understanding IP unnumbered

D. Configuration of the Cisco IOS DHCP server
E. Helper address examples

III. OSPF overview and Creating Multiple OSPF areas
A. OSPF terminology
B. Basic configuration steps
C. OSPF multi-area components
D. Configuring OSPF ABRs
E. OSPF stub area and totally stubby configuration
F. Creating Virtual link
G. How NSSA operates

IV. EIGRP Concepts and Route Optimization
A. EIGRP terminology
B. Summarization EIGRP routes for IP
C. Configuring Default route
D. RIP and OSPF redistribution

V. BGP operation and integrating BGP into ISP Networks
A. How BGP works
B. Route filtering and Manipulation Process
C. Issues of Redundancy, Symmetry, and Load Balancing

VI. Managing IP Traffic
A. Traffic Management techniques
B. Configuring IP session filtering (Reflexive Access Lists)
C. Context-Based Access Control

Cisco Networking Academy Curriculum at HCC

When a student takes a Cisco course at HCC, that student usually receives more instructional time than they would receive in other formats. Therefore, while taking Cisco Networking courses at HCC, the student may expect not only instruction from Cisco materials but additional academic and practical exercises and course work to better equip the student not only for the corresponding certification exam but for eventual utilization in their professional endeavors.

Course Requirements

Grading/Exams: Grading procedures will be determined by the individual faculty member but will be calculated on the basis of the tests, lab reports, quizzes and final exam. This course includes a comprehensive final exam and lab practical.

Other Course Information

This course is a course in the Computer Support Technology program and Telecommunications Technology program.
This course is also intended for students who wish to become a Cisco Certified Network Professional (CCNP).