Department:

Computer Support Technology

Course Description:

This course describes the architecture, components, and operation of routers, and explains the principles of routing and routing protocols. Students will analyze, configure, verify, and troubleshoot the primary routing protocols: Routing Information Protocol Version 1 (RIPv1), Routing Information Protocol Version 2 (RIPv2), Enhanced Interior Gateway Routing Protocol (EIGRP), and Open Shortest Path First (OSPF). The course will cover the recognition and correction of common routing issues and problems. The course includes a basic procedural lab, followed by basic configuration, implementation, and troubleshooting labs. Packet Tracer activities will reinforce concepts and allow students to model and analyze routing processes that may be difficult to visualize or understand. This is the second class in a series of four offerings to prepare for the Cisco Certified Network Associate (CCNA) certification.

Course Competencies:

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

1. Examine and analyze router elements: Random Access Memory (RAM), Read Only Memory (ROM), Cisco Discovery Protocol (CDP)
2. Describe the difference between connection-oriented and connectionless networks
3. Describe flow control and the three basic methods used in networking
4. Identify the functions of the Transmission Control Protocol/Internet Protocol (TCP/IP) transport layer protocols
5. Manage configuration files
6. Identify the functions performed by Internet Control Message Protocol (ICMP)
7. Identify and use main Cisco Internetwork Operating System (IOS) software setup, configuration, and interface commands
8. Load the Cisco IOS from flash memory, a Trivial File Transfer Protocol (TFTP) server or ROM
9. Backup, upgrade, and load the Cisco IOS
10. Prepare an initial configuration of a router and enable IP
11. Identify the parts in specific protocol address examples
12. List problems that each routing type encounters when dealing with topology changes and describe techniques to reduce their effect
13. Configure and verify IP addresses
14. Add the RIP and Interior Gateway Routing Protocol (IGRP) routing protocols to the router configuration
Course Content:

A. Introduction to Routing and Packet Forwarding  
B. Static Routing  
C. Introduction to Dynamic Routing Protocols  
D. Distance Vector Routing Protocols  
E. RIP Version 1  
F. Variable Length Subnet Masking (VLSM) and Classless Inter-Domain Routing (CIDR)  
G. RIP Version 2  
H. The Routing Table: A Closer Look  
I. EIGRP  
J. Link-State Protocols  
K. OSPF

Learning Assessments:

Competencies will be assessed by assignments, case problems, quizzes, chapter tests, hands-on projects, lab assignments, a mid-term exam, and a final exam. Exams may be in objective or problem solving format.

Instructional Materials:

CCNA2: Routers and Routing Online curriculum access


Guidelines for Requesting Accommodations Based on Documented Disability or Medical Condition

It is the intention of Highland Community College to work toward full compliance with the Americans with Disabilities Act, to make instructional programs accessible to all people, and to provide reasonable accommodations according to the law.

Students should understand that it is their responsibility to self-identify their need(s) for accommodation and that they must provide current, comprehensive diagnosis of a specific disability or medical condition from a qualified professional in order to receive services. Documentation must include specific recommendations for accommodation(s). Documentation should be provided in a timely manner prior to or early in the semester so that the requested accommodation can be considered and, if warranted, arranged.

On-Campus Students: At enrollment, any on campus student may complete a form that will allow them to self-identify any disability.

Off-Campus Regional Students: Self-identify your disability and accommodation needs with the Regional Coordinator and/or instructor, preferably prior to the first class meeting.
Online Students: Self-identify your disability and accommodation needs by contacting the Disabilities Coordinator. Students must provide their own programs to allow accessibility on their home computer.

Any student may also identify their disability by completing an online form located on the HCC homepage under Students Services/Resources/Disabilities. Questions should be directed to the Disabilities Coordinator.