

Department:

Computer Support Technology

Course Description:

This course provides a comprehensive, theoretical, and practical approach to learning the technologies and protocols needed to design and implement a converged switched network. Students learn about the hierarchical network design model and how to select services for each layer. The course explains how to configure a switch for basic functionality and how to implement Virtual Local Area Network (VLANs), VLAN Trunking Protocol (VTP), and Inter-VLAN routing in a converged network. The different implementations of Spanning Tree Protocol in a converged network are presented and students develop the knowledge and skills necessary to implement a Wireless Local Area Network (WLAN) in a small-to-medium network. This is the second class in a series of three 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. Appropriately configure switches with basic configurations such as name, banner, and passwords
2. Describe the benefits and functions of Virtual Local Area Networks (VLANs)
3. Implement VLANs on a switched network
4. Describe the Spanning Tree Protocol (STP) process
5. Implement STP on a switched network
6. Describe how Dynamic Host Configuration Protocol works for both IPv4 and IPv6
7. Implement DHCP for IPv4 on a router
8. Discuss appropriate security measure implemented at Layer2 of the OSI networking model
9. Describe general routing concepts
10. Implement static and default routes on a switched and routed network

Course Content:

- A. Switching Concepts
 1. Basic Device Configuration
 2. Switching Concepts
 3. VLANs
 4. Inter-VLAN Routing
- B. Redundant Networks
 1. STP Concepts
 2. EtherChannel
- C. Available and Reliable Networks
 1. DHCPv4

2. SLAAC and DHCPv6
3. FHRP Concepts
- D. L2 Security and WLANs
 1. LAN Security Concepts
 2. Switch Security Configuration
 3. WLAN Concepts
 4. WLAN Configuration
- E. Routing Concepts and Configuration
 1. Routing Concepts
 2. IP Static Routing
 3. Troubleshoot Static and Default Routes

Learning Assessments:

Competencies will be assessed by assignments, case problems, quizzes, chapter tests, hands-on projects, lab assignments, a midterm test, and a final test. The test can be in the objective format or in a problem solving format.

Instructional Materials:

Textbook: Empson, S. (2020). *CCNA Routing and Switching Portable Command Guide* (5th ed.). Indianapolis, IN: Cisco Press. ISBN-13: 978-0135937822

Cisco Networking Academy - <https://netacad.com>

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.

In order to begin the process all students **must** complete the “Disabilities Self-Identification Form” on our [Disability Services website](#).

This form can also be accessed at the Highland Community College homepage under Students Services/Student Resources/Disability Service or by contacting the Disabilities Coordinator.

A Note on Harassment, Discrimination and Sexual Misconduct

Highland Community College seeks to assure all community members learn and work in a welcoming and inclusive environment. Title VII, Title IX, and College policy prohibit harassment, discrimination and sexual misconduct. Highland Community College encourages anyone experiencing harassment, discrimination or sexual misconduct to talk to report to the Vice President for Student Services, the Human Resources Director or complete an [online report](#) about what happened so that they can get the support they need and Highland Community College can respond appropriately.

There are both confidential and non-confidential resources and reporting options available to you. Highland Community College is legally obligated to respond to reports of sexual misconduct, and therefore we cannot guarantee the confidentiality of a report, unless made to a confidential resource. Responses may vary from support services to formal investigations. As a faculty member, I am required to report incidents of sexual misconduct and thus cannot guarantee confidentiality. I must provide our Title IX coordinator with relevant details such as the names of those involved in the incident. For more information about policies and resources or reporting options, please review our [Equity Grievance Policy](#).