

## **CIT 283**

### **Wide Area Network Design and Management**

#### **Course Description**

This course is designed to provide students with the skills necessary to understand and apply advanced principles and applications in deploying networking hardware. This course covers WAN design, WAN connectivity protocols such as PPP, ISDN, and Frame Relay, as well as advanced network management projects. This is the fourth course in the Cisco Networking Academy Curriculum. Prerequisites: CIT 282; or consent of instructor.

#### **Course Competencies**

Upon successful completion of this course, the student can:

1. Demonstrate an understanding of Wide Area Networks (WAN).
2. Demonstrate an ability to design a Wide Area Network.
3. Describe the benefits of using a hierarchical design model.
4. Identify the three layers that make up the hierarchical model.
5. Describe the placement of other WAN technologies such as ISDN and Frame Relay.
6. Identify and describe the basic components defining PPP communication.
7. Demonstrate an understanding of Integrated Services Digital Networks (ISDN).
8. Demonstrate an understanding of Frame Relay.

#### **Course Outline**

- I. Wide Area Network (WAN)
  - A. Common WAN technologies
  - B. Wide area networking services, providers, interfaces
  - C. WAN frame encapsulation formats
  - D. WAN link options
- II. Wide Area Network (WAN) Design
  - A. Analyze requirements - gather data
  - B. Benefits of a hierarchical design model
  - C. Three-layer model components
  - D. Adding frame relay and ISDN WAN links
  - E. Traffic patterns
  - F. Server placement
- III. Point-to-Point Protocol (PPP)
  - A. PPP overview
  - B. Layering PPP elements
  - C. PPP operation
  - D. PPP frame formats
  - E. PPP LCP configuration options
  - F. PPP link negotiation
  - G. PPP authentication overview
  - H. Selecting a PPP authentication protocol

- I. Configuring PPP with authentication
- IV. Integrated Services Digital Network (ISDN)
  - A. ISDN Basic Rate Interface (BRI) overview
  - B. ISDN components
  - C. Configuring ISDN
- V. Frame Relay
  - A. Introduction to frame relay
  - B. Subinterfaces
  - C. Configuring frame relay