



CET 2620 Project Based Learning

Course Justification

This course is the fourth and final of the courses that together encompass the Cisco Certified Network Associate (CCNA) certification program. A CCNA is recognized in the computer networking and internetworking industry as one who is competent to install, configure and operate routed LAN, routed WAN and switched LAN and LANE networks. CCNA certification is the first level of professional certification in Cisco products and internetworking with the ultimate goal of Cisco Certified Internetworking Expert (CCIE) certification.

Upon completion of the four CCNA courses the student will be expected to take the official Cisco CCNA Certification Exam. Upon successful completion of the exam M-DCC will award the student the certification and Cisco will designate the student CCNA certified.



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Course Description - This is the fourth and final course of the Cisco curriculum that will lead the student toward the goal of achieving professional certification as a Cisco Certified Network Analyst (CCNA). Instruction includes networking, network terminology and protocols, network standards, students will complete advanced network design projects, and advanced network management projects, WAN theory and design, WAN technology, PPP, Frame Relay, ISDN, network trouble shooting, national SCANS skills and threaded case studies. This course is designed for students majoring in computer hardware and people from the industry already working in the of networking. Prerequisites: CET1600, CET1610, CET2615. Laboratory fee (3 hr. lecture 2 hr. lab)

Course Competencies

Competency 1: The student will demonstrate an understanding of Wide Area Networking (WAN) by:

- a. Describing the purpose of WANs.
- b. Describing types of wide area services.
- c. Describing various WAN devices.
- d. Defining and describing WAN standards and how they are applied.
- e. Defining and showing how WAN operations apply to the physical, data link, network, and application layers of the OSI model.
- f. Describing the interface with WAN service providers.
- g. Describing the use of WAN services with routers.

Competency 2: The student will demonstrate an understanding of WAN encapsulation formats by:

- a. Describing the following WAN encapsulation formats:
 - a. Serial line encapsulation.
 - b. High-Level Data Link Control (HDLC).
 - c. Point-to-Point Protocol (PPP).



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Competency 3: The student will demonstrate an understanding of WAN link options by:

- a. Describing the standards and capacities of link options.
- b. Describing the following WAN link options:
 - a. Standards and capacities
 - b. Dedicated
 - c. Switched
 - d. Dial-on demand

Competency 4: The student will demonstrate an understanding of the processes and considerations for designing a hierarchical model of a WAN by:

- a. Gathering data about the needs of the user.
- b. Describing the benefits of using a hierarchical design model.
- c. Describing the three layers of the hierarchical model and their functions.
- d. Describing the placement of Integrated Services Data Network (ISDN) and Frame Relay.
- e. Describing the impact on traffic of placement of the enterprise and workgroup servers.
- f. Designing a hierarchical WAN model.
- g. Implementing a hierarchical WAN Model.

Competency 5: The student will demonstrate an understanding of Point-to-Point Protocol (PPP) by:

- a. Describing the components, process, and operation of PPP communication.
- b. Describing PPP's connection negotiation process.
- c. Describing the use of Link Control Protocol (LCP) and Network Control Protocol (NCP) frames in PPP.
- d. Describing the process for configuring and verifying PPP.



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Competency 6: The student will demonstrate an understanding of Integrated Services Digital Network (ISDN) by:

- a. Describing the services, standards, components, operation and configuration of ISDN communication.
- b. Articulating why ISDN is used by industry.
- c. Describing the special services offered by ISDN communication.
- d. Applying the ISDN standards.
- e. Describing configuration and verification processes for ISDN connections.
- f. Configuring an ISDN connection.

Competency 7: The student will demonstrate an understanding of Frame Relay by:

- a. Describing the services, standards, components, operation and configuration of Frame Relay communication.
- b. Describing and using the basic devices of Frame Relay.
- c. Describing the functions of Data-Link Connection Identifier (DLCI) in Frame Relay.
- d. Describing a subinterface.
- e. Describing how Frame Relay uses subinterfaces to solve the problem of split horizon.
- f. Describing the process for configuring and verifying Frame Relay on router interfaces.
- g. Describing the process for configuring Frame Relay subinterfaces.
- h. Configuring a Frame Relay using:
 - a. Subinterfaces.
 - b. DLCI functions.