SYLLABUS

DIVISION: Business and Engineering Technology **REVISED:** SPRING 2014

CURRICULA IN WHICH COURSE IS TAUGHT: IST, Information Systems Technology

COURSE NUMBER AND TITLE: ITN 157 – Designing and Supporting Computer Networks-Cisco

CREDIT HOURS: 4 **HOURS/WK LEC:** 4 **HOURS/WK LAB:** 0 **LEC/LAB COMB:** 4

I. CATALOG DESCRIPTION: ITN 157 - Concentrates on an introduction to Wide Area Networking (WANs). Course content includes WAN design, LAPB, Frame Relay, ISDN, HDLC, and PPP.

II. RELATIONSHIP OF THE COURSE TO CURRICULA OBJECTIVES: ITN 157 will address the following Information Technology Outcomes:

- Implement Information Technology skills required by software applications.
- Apply methodologies to stay current in IT offerings, trends and certifications.
- Apply analytical and problem solving skills for computer system design, planning and support.
- Design, code, test, debug, and document software needed for computer system implementation and maintenance.
- Apply current IT industry standards, protocols, and techniques.
- Use instructional applications and material which could lead towards industry certification.

Please Note: The overall Learner Outcomes from all of the course requirements for the A.A.S. Degrees in IT are more in-depth than those of the Career Studies Certificates. However, the IT courses that are the same in both the A.A.S. Degrees and the Certificate Programs carry the same Learner Outcomes and are identical in content. Please review the DCC Catalog or visit the DCC Web Site for more details.

III. REQUIRED BACKGROUND: ITN 156

IV. COURSE CONTENT:

- Wide Area Networking
- WAN Design
- Point-to-Point Protocol (PPP)
- Integrated Services Digital Network (ISDN)
- Frame Relay

V. THE FOLLOWING GENERAL EDUCATION OBJECTIVES WILL BE ADDRESSED IN THIS COURSE. STUDENTS WILL:

X Communication
X Critical Thinking
Cultural and Social Understanding Information Literacy
X Personal Development
X Quantitative Reasoning
X Scientific Reasoning

VI. LEARNER OUTCOMES

VII. EVALUATION

Upon conclusion of this course the student will be able to define, discuss, and demonstrate knowledge in the following concepts.	
Identify Wide Area Networking	Lab Exercises and online test - Referencing the lab manual and in-class discussions, perform the necessary configurations to the routers and switches to access these types of WAN technologies. See additional learner outcomes for more details. Differentiate between the following WAN services: LAPB, Frame Relay, ISDN/LAPD, HDLC, PPP, and ADSL
Set up Point-to-Point Protocol (PPP) •	Lab Exercises and online test - Utilizing 2 or more routers, perform the necessary steps to configure PPP encapsulation to secure network traffic between all participating devices. To configure PPP encapsulation, use the Cisco Configuration Professional software package prior to using the CLI to make the necessary configurations on each participating router. Be able to identify PPP operations to encapsulate WAN data on Cisco routers. Configure a serial connection with PPP encapsulation. Configure authentication types (CHAP/PAP) on PPP links.
Configure Integrated Services Digital Network (ISDN)	Lab Exercises and online test - Utilizing the Adtran 550 perform the necessary configurations to allow for both external and internal ISDN modems to communicate. As an additional option, utilize the simulation software to demonstrate how ISDN functions prior to using the actual equipment. Identify ISDN protocols, function groups, reference points, and channels. Configure ISDN BRI and legacy dial-on-demand routing (DDR).
Configure Frame Relay	Lab Exercises and online test - Utilizing the Adtran 550 perform the necessary configurations to connect 4 Frame Relay links to 4 individual routers. As an additional option, utilize the simulation software to demonstrate how Frame Relay functions prior to using the actual equipment. Explain key Frame Relay terms and features. Configure Frame Relay LMIs, maps and sub-interfaces
Configure Digital Subscriber Line	Lab Exercises and online test - Using external and internal DSL routers/modules configure each device so that communications through the DSLAM is accomplished. Explain how DSL works and the key components required. Configure a DSLAM and a Cisco router with a T1 module installed.
Complete Packet Tracer Activity Labs •	Lab Exercises and online test - Utilizing the Cisco Academy provided Packet Tracer simulator, have each student identify the different switching components, design a basic network configuration using the identified components, then configure each device utilizing the CLI.

	Design and configure a basic switched networking structure that includes Routers, Switches, Wireless, PCs, and networking cabling. Upon completion of the training, the student will be able to calculate an appropriate IP addressing scheme for a designed network and configure all required components.
Hands-On Skills Exam	Final Skills Exam - Each student must complete a hands-on skills exam consisting of all the technologies, services, and networking configurations utilized during the entire semester. The student will be given a scenario consisting of this material and given 1 hour to build and make operational to show that the student has learned all the skills they will need. Actual Cisco routers and switches will be used for this exam.