SYLLABUS

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

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

COURSE NUMBER AND TITLE: ITN 156 – Introducing Routing and Switching in the Enterprise-Cisco

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

I. CATALOG DESCRIPTION: ITN 156 - Centers instruction in LAN segmentation using bridges, routers, and switches. Course content includes fast Ethernet, access lists, routing protocols, spanning tree protocol, virtual LANs, and network management.

II. RELATIONSHIP OF THE COURSE TO CURRICULA OBJECTIVES: ITN 156 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 155

IV. COURSE CONTENT:

- LAN Switching
- VLANs
- LAN Design
- Enhanced Interior Gateway Routing Protocol (EIGRP)
- Access Control Lists (ACLs)
- Network Design and implementation skills
- Network Management

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 and Configure LAN Switching	Lab Exercises and online test - Utilizing the IOS and the features of a Cisco switch, instruct the student on how to determine which method of switching best suits the requirements of the network. Demonstrate the Spanning-Tree Protocol (STP) through the use of the IOS on the switch and discuss the importance of the STP as it relates to access ports and trunk ports Distinguish between cut-through and store-and forward LAN switching. Describe the operation of the Spanning Tree Protocol and its benefits. Verify the operation of the Spanning Tree Protocol on the switch. Compare and contrast switches and bridges. Configure a switch for basic operations
Create and configure VLANs	Lab Exercises and online test - Discuss the purpose of VLANs and how they are configured on a switch. Instruct the student on how to create VLANs on a switch using the vlan.dat utility and how to apply them to a switch interface. Using vlan.dat instruct the student on how to set the client, server, and domain options of VTP. Describe the operation and benefits of VLANs. Configure VLANs on a switch. Configure VTP and Trunking on switches.
Create a LAN Design	Lab Exercises and online test - Discuss the purpose of half and full duplex systems and identify when each technology should be used. Focus on Voice Technologies as an example. Using the application Wireshark, demonstrate the amount of network broadcast traffic as well as client networking requests to show the impact on the Ethernet network. Through the use of VLANs, demonstrate the need for network segmentation to help increase network bandwidth. Be able to determine the appropriate uses of full- and half-duplex Ethernet operation. Describe the causes and effects of network congestion in Ethernet networks. Describe the benefits of network segmentation with various networking devices. Describe the function, operation and primary components on a LAN.
Begin 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 effectively to move on to semester IV. Actual Cisco routers and switches will be used for this exam.