NVCC COLLEGE-WIDE COURSE CONTENT SUMMARY
ITN 251- REMOTE ACCESS – CISCO (4 CR.)

COURSE DESCRIPTION
This course takes an in-depth look at a number of WAN technologies and their actual implementation. Topics covered include POTS and analog connectivity, ISDN (both BRI and PRI), and Frame Relay. In addition, emerging technologies in today's WAN environment are introduced.

Lecture – 4 hours per week

CO-REQUISITES OR PRE-REQUISITES
ITN 157 or TEL 251 or a valid and current CCNA certification from Cisco is required. ITN 208 or IST 208 is highly recommended.

COURSE OBJECTIVES
Upon completion of this course, the student will be able to:

- Provide remote access to a network
- Protect the integrity of the network
- Secure a remote access connection
- Setup dial-up access
- Setup ISDN access (BRI and PRI)
- Setup DDR
- Setup Frame Relay connections

COURSE CONTENT

- Identify and select appropriate products for remote connections and assembling and cabling the WAN components
- Configuring asynchronous connections with modems
- Configuring PPP using PAP and CHAP
- Using ISDN and DDR technologies and optimizing the Use of DDR interfaces
- Using X.25 for remote access
- Establishing dedicated Frame Relay connections
- Managing network performance with queuing and compression
- Scaling IP addresses with NAT
- Using TACACS+ and AAA to scale access control

STUDENT LEARNING OUTCOMES

REMOTE ACCESS SOLUTION

- Identify products that best meet WAN connection requirements
- Understand WAN connection types and the advantages and disadvantages of each
- Select appropriate equipment to suit the needs of a specific WAN topology
- Assemble and cable the selected components
CONFIGURING ASYNCHRONOUS CONNECTIONS

- Understand the procedures and commands necessary to configure asynchronous connectivity
- Use the appropriate commands to set up the modem with an auto-configuration feature
- Configure the router and the modem for dial-out connection
- Use correct commands to reverse telnet to the modem
- Configure a Cisco 700 Series router

CONFIGURING PPP

- Use correct commands to configure PPP connection
- Configure PAP and CHAP authentication for the PPP connection.
- Configure multi-link PPP and compression types to increase data throughput
- Use appropriate commands to verify proper PPP configuration
- Be able to access the central site with latest version of Windows
- Use PPP on an access server

USING ISDN AND DDR AND OPTIMIZING USE OF DDR INTERFACES

- Identify when to use ISDN BRI and PRI services
- Identify the Q.921 and Q.931 signaling and call set up sequences
- Specify the commands used to configure ISDN BRI and PRI
- Specify the commands used to configure DDR
- Select appropriate dial-up capabilities to place a call
- Use correct commands and procedures to configure rotary groups, dialer backups, and dialer profiles
- Use correct commands to verify proper dialer configuration
- Use DHCP on a Cisco router

USING X.25 FOR REMOTE ACCESS

- Configure an X.25 WAN connection between the central office and a branch office
- Specify proper X.121 addresses and assign them to router interfaces
- Use the correct commands and procedures to verify proper X.25 configuration.

ESTABLISHING A DEDICATED FRAME RELAY CONNECTION

- Use the correct commands and procedures to configure frame relay
- Use correct commands to configure sub-interfaces on a virtual interface
- Use correct commands to configure Frame Relay with traffic shaping
- Use correct commands and procedures to verify proper Frame Relay configuration

ENABLING A BACKUP TO THE PERMANENT CONNECTION

- Configure a backup connection to activate upon primary line failure
- Configure a backup connection to activate when primary line reaches specified threshold
- Configure a dialer to function as backup to the primary interface

MANAGING NETWORK PERFORMANCE WITH QUEUING AND COMPRESSION

- Determine the best queuing methods to implement and verify proper queuing configuration
- Use correct commands to configure weighted fair, priority, and custom queuing
- Effectively select and implement compression techniques
SCALING IP WITH NAT

- Understand how NAT and PAT operate
- Specify the commands and procedures to configure NAT and PAT
- Use correct commands to verify proper configuration of NAT and PAT

USING TACACS+ AND AAA TO SCALE ACCESS CONTROL

- Describe the security features of Cisco Secure using TACACS+ and AAA
- Use correct commands and procedures to configure AAA