CS 82.21D Course Outline as of Fall 2009

CATALOG INFORMATION

Dept and Nbr: CS 82.21D Title: ACCESSING THE WAN
Full Title: Accessing the WAN (Cisco Networking 4)
Last Reviewed: 5/11/2015

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	3.00	Lab Scheduled	0	8	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00 Total Student Learning Hours: 157.50

Title 5 Category:	AA Degree Applicable
Grading:	Grade Only
Repeatability:	00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:	
Formerly:	CIS 55.11D

Catalog Description:
This course, for the Information Technology (IT) professional, explains the principles of traffic control and access control lists (ACLs) and provides an overview of the services and protocols at the data link layer for wide-area access. Students learn about user access technologies and devices and discover how to implement and configure Point-to-Point Protocol (PPP), Point-to-Point Protocol over Ethernet (PPPoE), DSL, and Frame Relay. Wide Area Networks (WAN) security concepts, tunneling, and VPN basics are introduced. The course concludes with an introduction to quality of service (QoS).

Prerequisites/Corequisites:
Completion of CS 82.21C (formerly CIS 55.11C)

Recommended Preparation:
Eligibility for ENGL 100 or ESL 100

Limits on Enrollment:

Schedule of Classes Information:
Description: This course, for the Information Technology (IT) professional, explains the principles of traffic control and access control lists (ACLs) and provides an overview of the

services and protocols at the data link layer for wide-area access. Students learn about user access technologies and devices and discover how to implement and configure Point-to-Point Protocol (PPP), Point-to-Point Protocol over Ethernet (PPPoE), DSL, and Frame Relay. Wide Area Networks (WAN) security concepts, tunneling, and VPN basics are introduced. The course concludes with an introduction to quality of service (QoS). (Grade Only)
Prerequisites/Corequisites: Completion of CS 82.21C (formerly CIS 55.11C)
Recommended: Eligibility for ENGL 100 or ESL 100
Limits on Enrollment:
Transfer Credit: CSU;
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**			Effective:	Inactive:
CSU GE:	**Transfer Area**			Effective:	Inactive:
IGETC:	**Transfer Area**			Effective:	Inactive:
CSU Transfer:	Transferable	Effective:	Spring 2009	Inactive:	Fall 2015
UC Transfer:		Effective:		Inactive:	

CID:

Certificate/Major Applicable:
Not Certificate/Major Applicable

COURSE CONTENT

Outcomes and Objectives:
Upon completion of this course, students will be able to:
1. Manage network traffic with Access Control Lists (ACL)
2. Devise efficient network addressing schemes
3. Evaluate and implement basic network security in small to medium sized businesses
4. Differentiate between wide area network (WAN) and local area network (LAN) equipment and protocols
5. Plan and configure network connections from the LAN to the WAN
6. Construct Point-to-Point Protocol (PPP) connections to the WAN
7. Construct Frame Relay connections to the WAN
8. Differentiate between the Quality of Service (QoS) requirements for various types of network traffic
9. Formulate a network plan and set up a Virtual Private Network (VPN)

Topics and Scope:

Topics will include but not be limited to:
I. Managing network traffic with Access Control Lists (ACL)
  A. Typical usage of ACLs
  B. A single ACL with multiple lines

C. Configuration basics
1. Enabling and disabling one IP ACL per interface per direction
2. Design recommendations
3. Configuring numbered standard, numbered extended and named ACLs

II. Addressing Hosts: Network Address Translation (NAT), Dynamic Host Configuration Protocol (DHCP), and IPv6 Basics
A. Scaling networks with NAT
1. Private and public addresses
2. Understanding and configuring static, dynamic and overloaded NAT
B. DHCP, the process and configuration
C. Making more IP address space with version 6
1. Growing from 32 bits to 128 bits
2. Additional features incorporated in IPv6

III. Security
A. Vulnerabilities, threats and attacks
1. The need for network security and identifying potential risks
2. Trends driving network security
B. Basic router security
1. Controlling physical access
2. Remote configuration, passwords and privileged accounts
C. Security planning and policy

IV. Introduction to Wide Area Network (WAN) Technologies
A. WAN versus LAN and the WAN protocols
B. Leased lines, circuit and packet switching
C. WAN design

V. WAN devices and connections
A. Channel Service Unit (CSU)
B. Cable modem
C. DSL modem

VI. Connecting to the WAN
A. Leased Lines
B. Cable and DSL
C. Wireless

VII. Point-to-Point Protocol (PPP) and Point-to-Point Protocol over Ethernet
A. Serial point-to point links
B. PPP authentication
C. Configuring PPP

VIII. Frame Relay
A. Terminology and concepts
1. Virtual circuits
2. Data movement and flow control
B. Configuring Frame Relay

IX. Quality of Service (QoS) considerations
A. Requirements for voice, data, video and other traffic
B. QoS tools and models

X. Tunneling concepts and Virtual Private Network (VPN) basics
A. Site-to site and remote VPNs
B. Tunneling protocols
C. Encryption basics

Assignment:

Reading assignments may include:
1. Online research of network devices and deployment practices
2. Approximately 50 pages weekly from the textbook
Homework problems may include:
1. Hands-on exercises to demonstrate proficiency with each topic
2. Online quizzes
3. Creation of network design diagrams
Other assignments may include:
1. Objective examinations and quizzes
2. Skill demonstration examinations
3. Classroom scenario based exercises

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments and skill demonstrations are more appropriate for this course.	Writing 0 - 0%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework problems, Creation of network design diagrams and layouts	Problem solving 15 - 30%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Class performances, Performance exams, Network device configuration	Skill Demonstrations 20 - 30%

Exams: All forms of formal testing, other than skill performance exams.

Multiple choice, True/false, Matching items, Completion, Simulated equipment configuration	Exams 20 - 30%

Other: Includes any assessment tools that do not logically fit into the above categories.

Attendance and participation in scenario based exercises	Other Category 10 - 25%

Representative Textbooks and Materials:
Accessing the WAN, CCNA Exploration Companion Guide. Vachon, Bob and Graziani, Rick.

Cisco Press: 2008