

**CS 182.21D Course Outline as of Fall 2015****CATALOG INFORMATION**

Dept and Nbr: CS 182.21D Title: CONNECTING NETWORKS

Full Title: Connecting Networks (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 or P/NP

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly: CS 82.21D

**Catalog Description:**

Connecting Networks (Cisco Networking 4) is the last of four courses that prepares students for the Cisco Certified Networking Associate (CCNA) certification. This course discusses the Wide Area Network (WAN) technologies and network services required by converged applications in a complex network. The course enables students to understand the selection criteria of network devices and WAN technologies to meet network requirements. Students learn how to configure and troubleshoot network devices and resolve common issues with data link protocols. Students also develop the knowledge and skills needed to implement Internet Protocol Security (IPSec) and Virtual Private Network (VPN) operations in a complex network.

**Prerequisites/Corequisites:**

Course Completion of CS 182.21C

**Recommended Preparation:**

Eligibility for ENGL 100 or ESL 100

**Limits on Enrollment:****Schedule of Classes Information:**

Description: Connecting Networks (Cisco Networking 4) is the last of four courses that prepares

students for the Cisco Certified Networking Associate (CCNA) certification. This course discusses the Wide Area Network (WAN) technologies and network services required by converged applications in a complex network. The course enables students to understand the selection criteria of network devices and WAN technologies to meet network requirements. Students learn how to configure and troubleshoot network devices and resolve common issues with data link protocols. Students also develop the knowledge and skills needed to implement Internet Protocol Security (IPSec) and Virtual Private Network (VPN) operations in a complex network. (Grade or P/NP)

Prerequisites/Corequisites: Course Completion of CS 182.21C

Recommended: Eligibility for ENGL 100 or ESL 100

Limits on Enrollment:

Transfer Credit:

Repeatability: Two Repeats if Grade was D, F, NC, or NP

## **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

<b>AS Degree:</b>	<b>Area</b>	<b>Effective:</b>	<b>Inactive:</b>
<b>CSU GE:</b>	<b>Transfer Area</b>	<b>Effective:</b>	<b>Inactive:</b>

<b>IGETC:</b>	<b>Transfer Area</b>	<b>Effective:</b>	<b>Inactive:</b>
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<b>CSU Transfer:</b>	<b>Effective:</b>	<b>Inactive:</b>
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<b>UC Transfer:</b>	<b>Effective:</b>	<b>Inactive:</b>
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**CID:**

**Certificate/Major Applicable:**

Certificate Applicable Course

## **Approval and Dates**

Version:	03	Course Created/Approved:	9/29/2008
Version Created:	3/12/2015	Course Last Modified:	6/5/2021
Submitter:	Michael McKeever	Course last full review:	5/11/2015
Version Status:	Approved (Changed Course)	Prereq Created/Approved:	5/11/2015
Version Status Date:	5/11/2015	Semester Last Taught:	Spring 2021
Version Term Effective:	Fall 2015	Term Inactive:	Fall 2021

## **COURSE CONTENT**

### **Student Learning Outcomes:**

At the conclusion of this course, the student should be able to:

1. Evaluate and implement basic network security protocols in small to medium sized businesses.
2. Differentiate between and among the Quality of Service (QoS) requirements for various types of data network traffic.
3. Design and implement Wide Area Networks (WAN) and Virtual Private Networks (VPN).

### **Objectives:**

Upon completion of this course, students will be able

to:

1. Devise efficient network addressing schemes
2. Evaluate and implement basic network security in small to medium sized businesses
3. Differentiate between wide area network (WAN) and local area network (LAN) equipment and protocols
4. Plan and configure network connections from the LAN to the WAN
5. Construct Point-to-Point Protocol (PPP) connections to the WAN
6. Construct Frame Relay connections to the WAN
7. Differentiate between the Quality of Service (QoS) requirements for various types of network traffic
8. Formulate a network plan and set up a Virtual Private Network (VPN)
9. Monitor and troubleshoot network operations using syslog, SNMP, and NetFlow

## **Topics and Scope:**

Topics will include but not be limited to:

1. Hierarchical Network Design
  - a. Hierarchical Network Design Overview
  - b. Cisco Enterprise Architecture
  - c. 3. Evolving Network Architectures
2. Connecting to the WAN
  - a. WAN Technologies Overview
  - b. Selecting a WAN Technology
3. Point-to-Point Connections
  - a. Serial Point-to-Point Overview
  - b. PPP Operation
  - c. Configure PPP
  - d. Troubleshoot WAN Connectivity
4. Frame Relay
  - a. Introduction to Frame Relay
  - b. Configure Frame Relay
  - c. Troubleshoot Connectivity
5. Network Address Translation for IPv4
  - a. NAT Operation
  - b. Configuring NAT
  - c. Troubleshooting NAT
6. Broadband Solutions
  - a. Teleworking
  - b. Comparing Broadband Solutions
  - c. Configuring xDSL Connectivity
7. Securing Site-to-Site Connectivity
  - a. VPNsImplementing GRE Tunnels
  - b. LAB Configuring a Point-to-Point GRE VPN Tunnel
8. Monitoring the Network
  - a. Syslog
  - b. SNMP
  - c. Netflow
  - d. LAB Configuring Syslog and NTP
9. Troubleshoot the Network
  - a. Troubleshooting with a Systematic Approach
  - b. Network Troubleshooting

## 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. 6-10 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 of Network device configuration

Skill Demonstrations  
20 - 30%

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

6-10 quizzes and 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:

Connecting Networks Companion Guide (1st). Cisco Networking Academy. Cisco Press: 2014



## **OTHER REQUIRED ELEMENTS**

### **STUDENT PREPARATION**

Matric Assessment Required:	E	Requires English Assessment
Prerequisites-generate description:	U	User Generated Text
Advisories-generate description:	A	Auto-Generated Text
Prereq-provisional:	N	NO
Prereq/coreq-registration check:	Y	Prerequisite Rules Exist
Requires instructor signature:	N	Instructor's Signature Not Required

### **BASIC INFORMATION, HOURS/UNITS & REPEATABILITY**

Method of instruction:	02	Lecture
	72	Internet-Based, Delayed Interaction
	71	Internet-Based, Simultaneous Interaction
Area department:	CS	Computer Studies
Division:	72	Arts & Humanities
Special topic course:	N	Not a Special Topic Course
Program status:	1	Certificate Applicable Course
Repeatability:	00	Two Repeats if Grade was D, F, NC, or NP
Repeat group id:		

### **SCHEDULING**

Audit allowed:	N	Not Auditable
Open entry/exit:	N	Not Open Entry/Open Exit
Credit by exam:	N	Credit by examination not allowed
Budget code: Program:	0000	Unrestricted
Budget code: Activity:	0701	Computer & Information Science

### **OTHER CODES**

Discipline:	Computer Information Systems	
Basic skills:	N	Not a Basic Skills Course
Level below transfer:	Y	Not Applicable
CVU/CVC status:	Y	Distance Ed, Not CVU/CVC Developed
Distance Ed Approved:	Y	<a href="#">Exclusively online or other technology based instruction</a>
Emergency Distance Ed Approved:	Y	<a href="#">Fully Online</a> <a href="#">Partially Online</a> <a href="#">Online with flexible in-person activities</a>
Credit for Prior Learning:	N	Agency Exam
	N	CBE
	N	Industry Credentials
	N	Portfolio
Non-credit category:	Y	Not Applicable, Credit Course
Classification:	Y	Career-Technical Education
SAM classification:	C	Clearly Occupational
TOP code:	0708.10	Computer Networking
Work-based learning:	N	Does Not Include Work-Based Learning
DSPS course:	N	Not a DSPS Course

In-service:

N

Not an in-Service Course