

CATALOG INFORMATION

Dept and Nbr: CS 182.21C Title: SCALING NETWORKS
Full Title: Scaling Networks (Cisco Networking 3)
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 82.21C

Catalog Description:
Scaling Networks (CCNA 3) is the third of the four courses that prepares students for the Cisco Certified Networking Associate (CCNA) certification. This course describes the architecture, components, and operations of routers and switches in a large and complex network. Students learn how to configure routers and switches for advanced functionality. By the end of this course, students will be able to configure and troubleshoot routers and switches and resolve common issues with single and multi-area Open Shortest Path First (OSPF), Enhanced Interior Gateway Routing Protocol (EIGRP) and Rapid Spanning Tree Protocol (RSTP), in both Internet Protocol version 4 (IPv4) and IPv6 networks.

Prerequisites/Corequisites:
Course Completion of CS 82.21B

Recommended Preparation:
Eligibility for ENGL 100 or ESL 100

Limits on Enrollment:

Schedule of Classes Information:
Description: Scaling Networks (CCNA 3) is the third of the four courses that prepares students

for the Cisco Certified Networking Associate (CCNA) certification. This course describes the architecture, components, and operations of routers and switches in a large and complex network. Students learn how to configure routers and switches for advanced functionality. By the end of this course, students will be able to configure and troubleshoot routers and switches and resolve common issues with single and multi-area Open Shortest Path First (OSPF), Enhanced Interior Gateway Routing Protocol (EIGRP) and Rapid Spanning Tree Protocol (RSTP), in both Internet Protocol version 4 (IPv4) and IPv6 networks. (Grade or P/NP)

Prerequisites/Corequisites: Course Completion of CS 82.21B

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:

AS Degree:	Area	Effective:	Inactive:
CSU GE:	Transfer Area	Effective:	Inactive:

IGETC:	Transfer Area	Effective:	Inactive:
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CSU Transfer:	Effective:	Inactive:
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UC Transfer:	Effective:	Inactive:
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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. Design, configure and troubleshoot Rapid Spanning Tree Protocol (RSTP) in a Local Area Network (LAN).
2. Analyze the needs and requirements of a complex business network and implement the appropriate routing protocol.
3. Adjust routing protocol metrics to more efficiently direct network traffic to its intended destination.

Objectives:

Upon completion of this course, students will be able to:

1. Understand, configure and troubleshoot enhanced switching technologies such as Virtual Local Area Networks (VLANs), Rapid Spanning Tree Protocol (RSTP), Per VLAN Spanning Tree Plus Protocol (PVST+), and EtherChannel
2. Understand, configure, and troubleshoot first Hot Standby Router Protocols (HSRP) in a switched network
3. Understand, configure, and troubleshoot wireless routers and wireless clients
4. Configure and troubleshoot routers in a complex routed Internet Protocol (IP) v4 or IPv6 network using single-area Open Shortest Path First (OSPF), multi-area OSPF, and Enhanced Interior Gateway Routing Protocol (EIGRP)
5. Manage Cisco Internetworking Operating System (IOS) Software licensing and configuration files

Topics and Scope:

Topics will include but not be limited to:

1. Growing the Network
 - a. Scaling the Network
 - b. Switched Network
2. LAN Redundancy
 - a. Spanning Tree Concepts
 - b. Varieties of Spanning Tree Protocols
 - c. Spanning Tree Configuration
 - d. First Hop Redundancy Protocols
3. Link Aggregation
 - a. Link Aggregation Concepts
 - b. Link Aggregation Configuration
4. Wireless LANs
 - a. Wireless LAN Concepts
 - b. Wireless LAN Operation
 - c. Wireless LAN Security
 - d. Wireless LAN Configuration
 - e. Investigating Wireless Implementations
5. Adjust and Troubleshoot Single-Area OSPF
 - a. Advanced Single-Area OSPF Configurations
 - b. Troubleshooting Single-Area OSPF Implementations
6. Multiarea OSPF
 - a. Multiarea OSPF Operation
 - b. Configuring Multiarea OSPF
7. EIGRP
 - a. Characteristics of EIGRP
 - b. Configuring EIGRP for IPv4
 - c. Operation of EIGRP
 - d. Configuring EIGRP for IPv6
8. Adjust and Troubleshoot EIGRP
 - a. Advanced EIGRP Configurations
 - b. Troubleshoot EIGRP
9. IOS File Management
 - a. Managing IOS System Files
 - b. IOS Licensing

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:

Scaling 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	Exclusively online or other technology based instruction
Emergency Distance Ed Approved:	Y	Fully Online Partially Online Online with flexible in-person activities
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