CIS 55.11A Course Outline as of Spring 2009

CATALOG INFORMATION

Dept and Nbr: CIS 55.11A   Title: NETWORK FUNDAMENTALS
Full Title: Network Fundamentals (Cisco Networking 1)
Last Reviewed: 5/11/2015

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	4.00	Lecture Scheduled	4.00	17.5	Lecture Scheduled	70.00
Minimum	4.00	Lab Scheduled	0	8	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	4.00		Contact Total	70.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 140.00   Total Student Learning Hours: 210.00

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:

Catalog Description:
This course introduces the architecture, structure, functions, components, and models of the Internet and other computer networks. It uses the OSI (open systems interconnection) and TCP (transmission control protocol) layered models to examine the nature and roles of protocols and services at the application, network, data link, and physical layers. The principles and structure of IP (internet protocol) addressing and the fundamentals of Ethernet concepts, media, and operations are introduced to provide a foundation for the curriculum. Network simulator activities help students analyze protocol and network operation and build small networks in a virtual environment. Students build simple LAN (Local Area Network) topologies by applying basic principles of cabling, performing basic configurations of network devices, including routers and switches, and implementing IP addressing schemes.

Prerequisites/Corequisites:

Recommended Preparation:
Eligibility for ENGL 100 or ESL 100, AND Completion of CIS 51.12

Limits on Enrollment:

Schedule of Classes Information:
Description: This course introduces the architecture, structure, functions, components, and models of the Internet and other computer networks. It uses the OSI (open systems interconnection) and TCP (transmission control protocol) layered models to examine the nature and roles of protocols and services at the application, network, data link, and physical layers. The principles and structure of IP (internet protocol) addressing and the fundamentals of Ethernet concepts, media, and operations are introduced to provide a foundation for the curriculum. Network simulator activities help students analyze protocol and network operation and build small networks in a virtual environment. Students build simple LAN (Local Area Network) topologies by applying basic principles of cabling, performing basic configurations of network devices, including routers and switches, and implementing IP addressing schemes. (Grade Only)
Prerequisites/Corequisites:
Recommended: Eligibility for ENGL 100 or ESL 100, AND Completion of CIS 51.12
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:	Spring 2022
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. Examine the importance of data networks and the Internet in supporting business communications and everyday activities
2. Summarize how communication is accomplished in data networks and across the Internet
3. Differentiate the devices and services that are used to support communications across an Internetwork
4. Deduce the layers of communications in data networks through analysis of network protocol models
5. Examine the role of protocols in data networks
6. Evaluate the importance of addressing and naming schemes at various layers of data networks
7. Compare and contrast the protocols and services operating at the

application layer in the Open Systems Interconnection (OSI) model and examine how this layer operates in sample networks
8. Analyze the operations and features of the transport layer protocols and services
9. Analyze the operations and feature of the network layer protocols and services and explain the fundamental concepts of routing
10. Design, calculate, and apply subnet masks and addresses to fulfill given requirements
11. Interpret the operation of protocols at the OSI data link layer and examine how they support communications
12. Inspect the physical layer protocols and services supporting communications across data networks
13. Distinguish fundamental Ethernet concepts such as media, services, and operation
14. Choose basic cabling and network designs to connect devices in accordance with stated objectives
15. Experiment with Cisco Command Line Interface (CLI) to perform basic router and switch configuration

Topics and Scope:

Topics will include but not be limited to:
I. Living, Learning, Working, and Playing in a Network-Centric World
A. Communication-an essential part of our lives
 B. A network-centric world-supporting the way we communicate
II. Communications with Data Networks and the Internet
 A. Network models-a layered approach to communication
 B. Protocols-the rules of communication
 C. Labeling the pieces-addressing and naming of communications
III. Network Infrastructure
 A. Routers-connecting networks together
 B. Switches-connecting computers together
IV. OSI Application Layer
 A. Applications-the interface between the human and data networks
 B. Application layer protocols-making provision for applications and services
 C. Applications and services supporting our communications
V. OSI Transport Layer
 A. Roles of the transport layer-managing the pieces of our communications
 B. The User Datagram Protocol (UDP)-communicating with low overhead
 C. The Transmission Control Protocol (TCP)-communicating with reliability
 D. TCP-reassembling the pieces and managing data loss
VI. OSI Network Layer and Routing
 A. Roles of the network layer-carrying our communications from device to device
 B. Networks-dividing devices into groups
 C. Routing-enabling our communications between networks
VII. Addressing the Network-IPv4
 A. Internet Protocol v4 (IPv4) addresses
 B. Overview of IPv6

C. Subnetting-dividing networks into the right sizes
D. Testing the network layer with ping and traceroute
VIII. OSI Data Link Layer
 A. Data link layer-controlling the communication pieces on the media
 B. Media Access Control(MAC)-how does the media look?
 C. Media Access Control-addressing and framing the pieces
IX. OSI Physical Layer
 A. Physical layer-carrying the bits of our communications
 B. Physical signaling-transmitting the bits of our communications to
 the media
 C. Physical media-the connections for our communications
X. An Example LAN Technology-Ethernet
 A. Ethernet media-sending our communications through the LAN
 B. Ethernet overview
  1. Ethernet in the layers-MAC technology
  2. Ethernet in the layers-MAC addressing
 C. Address Resolution Protocol (ARP)-connecting the two layers of
 addresses
 D. Shared versus dedicated Ethernet-a closer look at hubs and switches
XI. Planning and Cabling Your Network
 A. Establishing device interconnection
 B. Developing an addressing scheme
 C. Importance of network diagrams
 D. Creating simple network diagrams
XII. Configuring and Testing Your Network
 A. Configuring Cisco devices - Cisco Internetworking Operating System
 (IOS) basics
 B. Applying a basic configuration using Cisco IOS
 C. Host computer configuration
 D. Verifying connectivity

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:
Network Fundamentals, CCNA Exploration Companion Guide (2nd). Dye, Mark and McDonald, Rick and Rufi, Antoon. Cisco Press: 2008