



South Central College

COMP 1360 Introduction to Data Communications and Networking

Course Outcome Summary

Course Information

Description	Introduction to Data Communications and Networking is designed to provide students with the foundation-level skills they need to install, operate, manage, maintain, and troubleshoot a small business network. This course provides an introduction to the hardware, software, terminology, components, design, and connections of a network. It covers networking concepts such as the OSI model, topologies, and major protocols, in addition to the basic functions of system administration and operation. COMP 1360 is operating system independent and provides an introduction to several popular network operating systems. Through lectures, discussions, demonstrations, interactive learning tools, and hands-on labs, this course teaches the fundamental skills and concepts that are essential to any kind of networking career. It helps students prepare to take the Network+ certification exam. (Prerequisite: None)
Total Credits	4
Total Hours	64

Types of Instruction

Instruction Type	Credits/Hours
Active Learning	4/64

Pre/Corequisites

None.

Institutional Core Competencies

Communication - Students will be able to demonstrate appropriate and effective interactions with others to achieve their personal, academic, and professional objectives.

Course Competencies

1. Describe the impact of computer networking on today's society

Learning Objectives

- Explain how networks impact daily life
- Describe the role of data networking in the human network

List the key components of a data network
List the opportunities and challenges posed by converged networks
List the main characteristics of common network architectures

2. List the fundamental concepts of data communication

Learning Objectives

Analyze the structure of a network
List the components of a network
Define the role of protocols in network communications
List the advantages of using a layered network model
Describe the role of each layer in the OSI and TCP/IP models
Explain the addressing and naming schemes used in network communications

3. Work with the application layer of the OSI model

Learning Objectives

List the three top layers in the OSI model
List the functions performed by the top three layers in the OSI model
Describe how people use the application layer when communicating across the network
Explain the functions of the well-known TCP/IP applications and their services
Describe how protocols ensure compatibility between different network devices
Analyze network traffic

4. Work with the transport layer of the OSI model

Learning Objectives

Describe the role of the OSI model's transport layer
Explain the difference between TCP and UDP
Describe how TCP and UDP function
List appropriate uses of TCP and UDP

5. Work with the network layer of the OSI model

Learning Objectives

Explain how packets are routed from a device on one network to a device on a different network
Describe how IP provides connectionless service
Explain the difference between physical and logical networks
Describe how routers use next-hop addresses to determine the path that packets need to take to reach their destinations
Describe how routers forward data packets

6. Explain the structure of IPv4 addresses

Learning Objectives

Describe the IPv4 addressing structure
Convert numeric values from binary, hexadecimal, or decimal to another numbering system
Explain how network administrators assign network addresses
Explain how ISPs assign network addresses
Calculate the network portion of a host address
Calculate the host portion of a host address
Explain the role of the subnet mask in dividing networks
Test networks to verify connectivity and operational status

7. Work with the data link layer of the OSI model

Learning Objectives

Describe the role of the data link layer protocols
Explain how the data link layer prepares data for transmission
Explain MAC and how its methods function
List the component parts of a Layer 2 frame and their roles

8. Work with the physical layer of the OSI model

Learning Objectives

List the physical layer protocols and their roles

Describe physical layer signaling and encoding
Explain how electrical signals can be used to represent data bits
List the basic characteristics of copper cable, fiber optic cable, and wireless network media

9. Describe the characteristics and operation of Ethernet

Learning Objectives

Describe the evolution of Ethernet
Describe the Ethernet frame and the purposes of its fields
Explain how Ethernet makes use of the physical and data link layers
Explain the differences between an Ethernet hub and an Ethernet switch
Describe ARP and its operation

10. Work with data communications network media

Learning Objectives

List the basic network media required to make a LAN connection
Describe the differences between intermediate and end-device connectivity in a LAN
List the pin-out configurations for straight-through and crossover cables

11. Construct a simple Ethernet LAN

Learning Objectives

Construct a straight-through and a crossover cable
Design an addressing scheme for a network
Create a logical design of a simple Ethernet LAN
Create a physical design of a simple Ethernet LAN

12. Explain the importance of information security

Learning Objectives

Define information security
Identify the challenges for information security
List important information security terms

13. Describe information security attacks

Learning Objectives

Describe the four basic types of attacks
Create an attack and attacker profile
Identify denial of service attacks
Define malicious code

14. Describe the basic principles of designing a secure system

Learning Objectives

Identify who is responsible for information security
List the five principles of information security
Explain the three pillars of information security

15. Describe how to secure a simple Ethernet LAN

Learning Objectives

Disable non-essential systems
Harden operating systems and applications
Secure the network infrastructure
Secure removable media

16. Explain how to protect internet-based services

Learning Objectives

List the main vulnerabilities of internet-based services
Implement security measures for electronic mail, web browsing, and instant messaging

17. List the practical uses of cryptography

Learning Objectives

- Define cryptography
- Explain how to use cryptography
- Describe the public key/private key system
- Create a public key/private key set
- Create a self-signed certificate

SCC Accessibility Statement

South Central College strives to make all learning experiences as accessible as possible. If you have a disability and need accommodations for access to this class, contact the Academic Support Center to request and discuss accommodations. North Mankato: Room B-132, (507) 389-7222; Faribault: Room A-116, (507) 332-7222.

Additional information and forms can be found at: www.southcentral.edu/disability

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