

SYLLABUS
PART I
EDISON STATE COMMUNITY COLLEGE
CYB 246S INTRODUCTION TO NETWORKS
3 CREDIT HOURS

COURSE DESCRIPTION

Introduction to foundational networking concepts, architectures, and protocols, including the OSI model, IPv4 and IPv6 addressing, switching, routing, and basic network security. Emphasizes hands-on configuration of network devices and the use of Cisco Packet Tracer to design, implement, and troubleshoot small local area networks (LANs). Prepares students for advanced networking coursework and the Cisco Certified Network Associate (CCNA) certification. Prerequisite: CIS 215S. Lab fee.

COURSE GOALS

The student will:

Bloom's Level		Program Outcomes
2	1. Describe the fundamental concepts of networking, including network architectures, models, protocols, and the purpose of the OSI and TCP/IP models.	4, 6
2	2. Explain the role and functions of network devices such as routers, switches, and end devices in a networked environment.	4, 8
3	3. Apply IP addressing schemes using both IPv4 and IPv6 to ensure effective communication within a network.	3, 6, 8
3	4. Configure network devices, including routers and switches, with initial settings, IP addressing, and basic security measures.	7, 8
4	5. Demonstrate the ability to create, manage, and troubleshoot local area networks (LANs) using virtualized environments.	3, 7, 8
4	6. Analyze network traffic using network monitoring tools and protocols to identify and resolve connectivity and performance issues.	3, 7, 8
3	7. Identify network security threats and implement device-hardening techniques to enhance network security and protect against vulnerabilities.	5, 7, 8
4	8. Compare different network topologies, media types, and cabling methods to determine the most appropriate solutions for various network environments.	3, 6
2	9. Examine common protocols and services, including DNS, DHCP, and ICMP, to understand their roles in network communication and management.	4, 8
3	10. Create network documentation, including diagrams and configuration files, to support network design, configuration, and troubleshooting activities.	2, 8

CORE VALUES

The Core Values are a set of principles that guide in creating educational programs and environments at Edison State. They include communication, ethics, critical thinking, human diversity, inquiry/respect for learning, and interpersonal skills/teamwork. The goals, objectives, and activities in this course will introduce/reinforce these Core Values whenever appropriate.

TOPIC OUTLINE

1. Networking Today
2. Network Devices and Topologies
3. Ethernet and Switching Fundamentals
4. Subnetting and IP Addressing Basics
5. Basic Switch and End Device Configuration
6. Routing Concepts and Protocols
7. Network Services - DHCP, DNS, and NAT
8. Transport Layer: TCP and UDP Protocols
9. Wireless Networking
10. Virtual Networks and Virtualization
11. Advanced IP Services
12. Network Layer
13. Address Resolution Protocol (ARP) and Neighbor Discovery
14. IP Addressing: IPv4 and IPv6
15. Network Security Fundamentals
16. Network Management and Monitoring
17. Network Monitoring and Troubleshooting Tools
18. Network Design, Implementation, and Documentation