SYLLABUS
PART I
EDISON STATE COMMUNITY COLLEGE
CYB 248S SECURITY AND AUTOMATION
3 CREDIT HOURS

COURSE DESCRIPTION
Covers the architecture, components, and operations of enterprise networks. Topics include wide area network (WAN) technologies, network security, automation, and software-defined networking. Students will gain hands-on experience in configuring, securing, and troubleshooting enterprise network devices and understand how application programming interfaces (APIs) support network automation. This course prepares students for real-world networking challenges and aligns with the Cisco Certified Network Associate (CCNA) certification objectives. Prerequisite: CYB 247S with a grade of "C" or better. Lab fee.

COURSE GOALS
The student will:

Bloom's Level			Program Outcomes
2	1.	Describe the architectures and components of enterprise networks, including WAN technologies, and how they support large-scale networks.	6, 8
2	2.	Explain the role of Single-Area OSPFv2 in ensuring efficient network routing in enterprise environments.	6, 8
3	3.	Configure Single-Area OSPFv2 on routers to ensure efficient routing in both point-to-point and multi-access networks.	7, 8
3	4.	Implement Network Address Translation (NAT) services to provide IPv4 address scalability and improve network management.	6, 7, 8
5	5.	Develop Access Control Lists (ACLs) to control and secure traffic through the network based on IPv4 and IPv6 addresses.	7, 8
4	6.	Troubleshoot Single-Area OSPFv2 configurations in enterprise networks to resolve network connectivity and performance issues.	3, 8
3	7.	Configure a Virtual Private Network (VPN) using IPsec to ensure secure remote access for enterprise users.	7, 8
4	8.	Analyze network performance and traffic flow using Quality of Service (QoS) mechanisms to prioritize and optimize bandwidth usage.	3, 5, 8
5	9.	Design a scalable and secure Wide Area Network (WAN) solution that supports remote users and optimizes network performance.	3, 6, 7, 8
3	10.	Utilize network management tools to monitor, manage, and troubleshoot enterprise network performance and security issues.	3, 8
5	11.	Evaluate software-defined networking (SDN) concepts, including controller-based architectures, and their role in enterprise network automation.	5, 8
3	12.	Implement network automation using Application Programming Interfaces (APIs) to support efficient enterprise network operations and management.	5, 7, 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. Single-Area OSPFv2 Concepts
2. Single-Area OSPFv2 Configuration
3. Network Security Concepts
4. ACL Concepts
5. ACLs for IPv4 Configuration
6. NAT for IPv4
7. WAN Concepts
8. VPN and IPsec Concepts
9. QoS (Quality of Service) Concepts
10. Network Management
11. Network Design
12. Network Troubleshooting
13. Network Virtualization
14. Network Automation