

CUYAMACA COLLEGE
COURSE OUTLINE OF RECORD

COMPUTER AND INFORMATION SCIENCE 203 – CISCO ACADEMY – ENTERPRISE NETWORKING, SECURITY, AND AUTOMATION

2 hours lecture, 3 hours laboratory, 3 units

Catalog Description

This is the third of four courses designed to provide knowledge, experience and skills in current and emerging networking technology. This course is also designed to help students prepare for the professional certification as a Cisco Certified Network Associate (CCNA). Scaling Networks describes the architecture, components, and operations of routers and switches in larger and more complex networks. 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 Open Shortest Path First (OSPF) protocol, Enhanced Interior Gateway Routing Protocol (EIGRP), First Hop Redundancy Protocols (HSRP), EtherChannel, and Spanning-Tree Protocol (STP) in both IPv4 and IPv6 networks. Students will also develop the knowledge and skills needed to implement a WLAN in a small-to-medium network. This course maps to the current Cisco Certified Networking Associate curriculum version.

Prerequisite

"C" grade or higher or "Pass" in CIS 202 or completion of CCNA2 Version 6 at another Cisco Networking Academy, or explicit instructor permission

Entrance Skills

Without the following skills, competencies and/or knowledge, students entering this course will be highly unlikely to succeed:

- 1) Basic understanding of networking and routing principles using the following networking protocols: single-area OSPF, RIP v1, RIPv2, RIPv6, TCP/IP, ACLs, DHCP, NAT for IPv4 and VLANs. The ability to design and configure simple classful and classless network topologies consisting of workstations, Cisco switches and Cisco routers.

Course Content

- 1) Introduction to Scaling Networks
- 2) LAN Redundancy
- 3) Link Aggregation
- 4) Wireless LANs
- 5) Adjust and Troubleshoot Single-Area OSPF
- 6) Multi-area OSPF
- 7) EIGRP
- 8) EIGRP Advanced Configurations and Troubleshooting
- 9) IOS Images and Licensing

Course Objectives

Students will be able to:

- 1) Configure and troubleshoot DHCP and DNS operations for IPv4 and IPv6.
- 2) Describe the operations and benefits of the Spanning Tree Protocol (STP).
- 3) Configure and troubleshoot STP operations.
- 4) Describe the operations and benefits of link aggregation and Cisco VLAN Trunk Protocol (VTP).
- 5) Configure and troubleshoot VTP, STP, and RSTP.

- 6) Configure and troubleshoot basic operations of routers in a complex routed network for IPv4 and IPv6.
- 7) Configure and troubleshoot advanced operations of routers and implement RIP, OSPF, and EIGRP routing protocols for IPv4 and IPv6.
- 8) Manage Cisco IOS Software licensing and configuration files.

Method of Evaluation

A grading system will be established by the instructor and implemented uniformly. Grades will be based on demonstrated proficiency in the subject matter determined by multiple measurements for evaluation, one of which must be essay exams, skills demonstration or, where appropriate, the symbol system.

- 1) Chapter exams that measure students' ability to define and appropriately use networking technology concepts and terminology to describe networking processes, protocols, functions and features.
- 2) Comprehensive final exam that measures students' ability to synthesize and apply course concepts to a variety of networking scenarios.
- 3) Comprehensive skills exam that measures students' ability to practically apply network, design, configuration and hardware connectivity techniques to LAN environments.
- 4) Lab exercises that require students to apply course concepts and skills in order to implement LAN solutions, compute IPv4 network addressing to network problems defined by the instructor, and connect and configure LAN devices.

Special Materials Required of Students

USB flash drive

Minimum Instructional Facilities

Smart computer lab with whiteboards, Internet browser, Internet connectivity, software, printer; network connection not connected to school academic resources; 19" equipment racks populated with cross-connect patch panels, power surge protectors, access servers, VM servers; Cisco Access routers and switches; interconnecting CAT 5E and serial cabling; lab desks with computers not connected to the school academic network resources; computer server; storage cabinets

Method of Instruction

- 1) Online computer-based reading assignments
- 2) Instructor and Individual student mentoring
- 3) Practical application assignments
- 4) Topic-focused mini-lectures for small groups of students

Out-of-Class Assignments

- 1) Read online curriculum and assignment instructions
- 2) Complete Packet Tracer assignments and online quizzes
- 3) Review online resources, including reference materials and videos

Texts and References

- 1) Required (representative example): Text is provided online at www.netacad.com
- 2) Supplemental (optional reference texts): CCNA 200-301 Official Cert Guide Library Wendell Odom • ISBN 9781587147142, 2020

Exit Skills

Students having successfully completed this course exit with the following skills competencies and/or knowledge:

- 1) Ability to define, configure and troubleshoot enhanced switching technologies such as VLANs, Rapid Spanning Tree Protocol (RSTP), Per VLAN Spanning Tree Plus Protocol (PVST+), and EtherChannel.

- 2) Ability to define, configure and troubleshoot first hop redundancy protocols (HSRP) in a switched network.
- 3) Ability to define, configure and troubleshoot wireless routers and wireless clients.
- 4) Ability to configure and troubleshoot routers in a complex routed IPv4 or IPv6 network using single-area OSPF, multi-area OSPF, and EIGRP.
- 5) Ability to manage Cisco IOS® Software licensing and configuration files.

Student Learning Outcomes

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

- 1) Build, configure, and troubleshoot a small local area network topology consisting of Cisco routers, Cisco switches, wireless routers, and workstations with multiple broadcast and collision domains and basic network security techniques. Manage the Cisco operating system and configuration files. Configure routers and switches using the following network protocols: STP, VTP, PAgP, LACP, IEEE802.1q, RIP (v1, v2, and ng), single-area and multi-area OSPF, EIGRP, NAT, DHCP, IPv4, and IPv6.