Lecture Contact Hours: 32-36; Homework Hours: 64-72; Total Student Learning Hours: 96-108
Laboratory Contact Hours: 48-54; Homework Hours: 0; Total Student Learning Hours: 48-54

CUYAMACA COLLEGE
COURSE OUTLINE OF RECORD

COMPUTER AND INFORMATION SCIENCE 205 – IMPLEMENTING CISCO IP ROUTING (ROUTE)

2 hours lecture, 3 hours laboratory, 3 units

Catalog Description
This course covers topics necessary to successfully complete the Cisco Certified Networking Professional ROUTE certification. Skills necessary for implementing, monitoring, and maintaining routing services in an enterprise network will be enhanced. Students will learn how to plan, configure, and verify the implementation of complex enterprise LAN and WAN routing solutions using a range of IPv4 and IPv6 routing protocols. Topics include: EIGRP (Enhanced Interior Gateway Routing Protocol); Multi-area OSPF (Open Shortest Path First) routing protocols; mechanisms for controlling routing updates and traffic; BGP (Border Gateway Protocol); and secure routing solutions. This lab-intensive course provides hands-on experience building and configuring complex networks using Cisco routers and switches.

Prerequisite
"C" grade or higher or "Pass" in CIS 204 or equivalent or successful completion of the current version of CCNA1, 2, 3 and 4 at another Cisco Networking Academy or possess a current CCNA.

Entrance Skills
Without the following skills, competencies and/or knowledge, students entering this course will be highly unlikely to succeed:
1) A working knowledge of the Cisco IOS CLI; IPv4 and IPv6 network addressing; EIGRP, OSPF, and Static routing; Basic LAN and WAN network topologies; Ethernet and WAN serial technologies; and remotely accessing network devices.

Course Content
1) Basic Network and Routing Concepts
2) EIGRP Implementation
3) OSPF Implementation
4) Manipulating Routing Updates
5) Path Control Implementation
6) Enterprise Internet Connectivity
7) BGP Implementation
8) Routers and Routing Protocol Hardening

Course Objectives
Students will be able to:
1) Implement EIGRP and OSPF in an enterprise network
2) Implement various mechanisms for controlling routing updates and traffic
3) Implement BGP to in an enterprise network

4) Describe the basic requirements to establish an IPV4 and IPv6 single-homed network connection to an ISP
5) Implement IPv6 in an enterprise network

Method of Evaluation
A grading system will be established by the instructor and implemented uniformly. Grades will be based on demonstrated proficiency in subject matter determined by multiple measurements for evaluation, one of which must be essay exams, skills demonstration or, where appropriate, the symbol system.
1) Written quizzes and exams that measure students' ability to describe computer operating system functions and characteristics, and analyze a scenario and choose the alternatives and troubleshooting options.
2) Scenario-based lab activities that measure students' ability to configure specific operating system functions or subsystems, troubleshoot/analyze imposed system problems, investigate potential alternatives, and implement corrective action to achieve a determined result.
3) Practical application-based examinations that measure students' ability to evaluate scenario-based computer configuration requirements/problems, analyze/troubleshoot the operating system configuration, and apply the correct configuration changes to achieve the correct results.

Special Materials Required of Student
Electronic storage media

Minimum Instructional Facilities
Computers with Internet browser, Internet connectivity, and software; network connection that is not connected to school academic resources; 19-inch equipment racks populated with cross-connect patch panels, Cisco Access routers and switches, interconnecting CAT 5E and Serial cabling; whiteboards; student desks and chairs; teacher desk and chair; lab desks with computers not connected to the school academic network resources; overhead computer projection system and screen; printer; computer server; storage cabinets.

Method of Instruction
1) Lecture and demonstration
2) Hands-on practice using the laboratory routers, switches, patch panels, access servers, computers, and virtualized PCs

Out-of-Class Assignments
May include the following:
1) Reading assignments
2) Technical skill labs using NetLabs
3) Technical skill labs using laboratory routers, switches, patch panels, access servers, computers, and virtualized PCs
4) Tests and quizzes

Texts and References
1) Required (representative example):
   a. Implementing Cisco IP Routing (ROUTE) Foundation Learning Guide: (CCNP ROUTE 300-101) (Foundation Learning Guides) – by Diane Teare (Author), Bob Vachon (Author), Rick Graziani (Author); Series: Foundation Learning Guides; Hardcover: 768 pages; Publisher: Cisco Press; 1 edition (January 25, 2015); Language: English;ISBN-10: 1587204568; ISBN-13: 978-1587204562

2) Supplemental:
    a. CCNP Routing and Switching Portable Command Guide Paperback – by Scott Empson (Author), Patrick Gargano (Author), & 1 more; Series: Portable Command Guide; Paperback: 416 pages; Publisher: Cisco Press; 1 edition (January 1, 2015); Language: English; ISBN-10: 1587144344; ISBN-13: 978-1587144349
    b. CCNP Routing and Switching ROUTE 300-101 Official Cert Guide by Kevin Wallace (Author); Series: Official Cert Guide; Hardcover: 880 pages; Publisher: Cisco Press; 1 edition (December 19, 2014); Language: English; ISBN-10: 1587205599; ISBN-13: 978-1587205590

Exit Skills

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

1) Ability to configure, manage and troubleshoot IPv4 and IPv6 EIGRP Networks
2) Ability to configure, manage and troubleshoot IPv4 and IPv6 OSPF Networks
3) Ability to configure, manage and troubleshoot IPv4 and IPv6 BGP Networks
4) Ability to configure, manage and troubleshoot mechanisms for controlling routing updates and traffic
5) Ability to configure, manage and troubleshoot technologies for securing network routers.

Student Learning Outcomes

Upon successful completion of this course, students will be able to:
Successfully configure an instructor-defined secure router-based network scenario using the following routing protocols: EIGRP, OSPF, BGP, IPv4, and IPv6.