COURSE INFORMATION FORM

DISCIPLINE: CSIS  
COURSE TITLE: Scaling Networks CCNA 3  
CR.HR: 4  LECT HR: 3  LAB HR: 2  CLIN/INTERN HR: 0  CLOCK HR: 0

CATALOG DESCRIPTION
This course describes the architecture, components and operations of routers and switches in larger more complex networks. Students learn how to configure router and switches for advanced functionality. By the end of the course, students will be able to configure and troubleshoot routers and switches and resolve common issues with OSPF, EIGRP and STP in both IPv4 and IPv6 networks. Students also develop the knowledge and skills necessary to implement WLAN in a small-to-medium network.

PREREQUISITES
CSIS 113

EXPECTED STUDENT OUTCOMES IN THE COURSE (ESO)
Upon completion of this course, the student will be able to:
1. Identify network scalability design terminology.
2. Explain the purpose of Spanning Tree Protocol (STP) in a switched LAN environment with redundant links.
3. Configure and verify rapid spanning tree PVST+ and load balancing.
4. Implement PortFast and BPDU Guard.
5. Configure, verify and troubleshoot VLANs, native VLAN and trunks.
6. Configure and verify first hop redundancy using HSRP.
7. Configure and verify first hop redundancy using GLBP.
8. Implement a redundant Etherchannel link.
9. Configure, secure and verify a wireless router and client.
10. Configure and verify single-area OSPFv2 and OSPFv3 routing.
11. Configure a multiarea OSPFv2 and OSPFv3 network with interarea summary routes.
12. Implement and verify EIGRP for IPv4 and IPv6 routing.
13. Implement and verify advanced EIGRP features to enhance operation in a small-to-medium size network.
17. Manage Cisco IOS configuration files (save, edit, upgrade and restore).
GENERAL EDUCATION OUTCOMES (ESO)
Specify which general education outcomes, if any, are substantially addressed by the course. Numbers in parentheses identify the Expected Student Outcomes linked to the specific General Education Outcome.

<table>
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<tr>
<th>Outcomes</th>
<th>ESO</th>
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PROGRAM-LEVEL OUTCOMES

CAREER AND TECHNICAL EDUCATION PROGRAM OUTCOMES
Specify which Career and Technical program outcomes, if any, are substantially addressed by the course by completing the “Career and Technical Education template” to show the relationship between course and program outcomes to assessment measures.

The student will demonstrate:

1.  the ability to use industry specific software and/or apply troubleshooting skills to solve problems. (3-17)
2.  the ability to work effectively in a team environment. (1-17)

CLASS-LEVEL ASSESSMENT MEASURES
Student accomplishment of expected student outcomes may be assessed using the following measures. (Identify which measures are used to assess which outcomes.)

Classroom Discussion/Participation (1-17)
Assignments/Labs (1-17)
Written Exam (1-17)
Skills Exam (1-17)
I. Introduction to Scaling Networks
   A. Implementing a Hierarchical Network Design
   B. Selecting switch hardware, port density, Power Over Ethernet, Multilayer Switching
   C. Selecting router hardware
II. LAN Redundancy
    A. Spanning tree concepts and operation
    B. Varieties of spanning tree protocols
    C. Spanning tree configuration
    D. First hop redundancy protocols
III. Link Aggregation
    A. EtherChannel operation
    B. EtherChannel configuration
IV. Wireless LANS
    A. Introduction to Wireless components and topologies
    B. Wireless LAN operations and channel management
    C. Wireless LAN security
    D. Configuring a wireless router and client
V. Adjust and Troubleshoot Single-Area OSPF
   A. Advanced single-area OSPFv2 and OSPFv3 configurations
   B. Troubleshooting single-area OSPFv2 and OSPFv3
VI. Multiarea OSPF
    A. Multiarea OSPF operation
    B. Configuring and verifying multiarea OSPF operation with route summarization
VII. EIGRP
    A. Characteristics of EIGRP
    B. Configuring EIGRP for IPv4
    C. Operation of EIGRP, metrics, DUAL and topology table
    D. Configuring EIGRP for IPv6
VIII. EIGRP Advanced Configurations and Troubleshooting
     A. Advanced EIGRP configuration with automatic summarization, default route propagation and authentication
     B. Troubleshoot EIGRP and neighbor issues
IX. IOS Images and Licensing
   A. Naming conventions and managing images
   B. IOS software licensing, verification and management