Master Syllabus

CIS 2421 - Scaling Networks

Division: Business and Public Services

Department: Computer Information Systems

Credit Hour Total: 4.0   **Lecture Hrs:** 4.0

Prerequisite(s): CIS 2416

Other Prerequisite(s): Other CIS 2416 must be completed within the past two years.

Date Revised: December 2015

Course Description:

The focus of this course is on the architecture, components and operations of routers and switches in a larger and more complex network. Students will learn how to configure routers and switches for advanced functionality. Students will be able to configure and troubleshoot routing protocols and wireless networks using IPv4 and IPv6 on equipment from various vendors. The Linux operating system will be used.

General Education Outcomes:

- Critical Thinking/Problem Solving Competency
- Computer Literacy Competency

Course Outcomes:

Linux Essentials.
Describe and explain the Linux community and finding your way on a Linux system. Work and enter commands at the Linux command line. Perform easy maintenance tasks, help users, add user to a larger system, backup and restore, shutdown and reboot Linux systems. Install and configure a workstation and connect it to a LAN or connect a standalone PC to the Internet.

Assessment Method: Simulations
Performance Criteria:

Obtain score of 80% or higher on assignments.

Assessment Method: Standardized national examinations
Performance Criteria:

Obtain a score 80% or higher on exam.

IOS images and licensing.
Describe and explain the use of naming and licensing of IOS images in networking equipment. Configure, install and upgrade an IOS image to a piece of networking equipment.

Assessment Method: Simulations
Performance Criteria:

Obtain score of 80% or higher on assignments.

Assessment Method: Standardized national examinations
Performance Criteria:

Obtain a score 80% or higher on exam.

Hierarchical Networks
Design, build, and configure hierarchical networks with appropriate hardware using a IOS.

Assessment Method: Simulations
Performance Criteria:

Obtain score of 80% or higher on assignments.

Assessment Method: Standardized national examinations
Performance Criteria:

Obtain score of 80% or higher on assignments.

Advanced switching operations.
Describe enhanced switching technologies such as VLAN Trunking Protocol (VTP), Rapid Spanning Tree Protocol (RSTP) and IEEE 802.1q frame tagging. Troubleshoot STP implementation, ether channel, and link aggregation. Describe and understand the use of VOIP on the network and configure and manage a VOIP network with the use communication management software.

Assessment Method: Simulations
Performance Criteria:

Obtain score of 80% or higher on assignments.

Assessment Method: Standardized national examinations
Performance Criteria:

Obtain a score 80% or higher on exam.

Advance routing and troubleshooting.

Describe how a router determines path information through advanced router configurations (OSPF). Use the command line interface (CLI) to investigate routing tables and troubleshoot network problems. Configure advanced classless routing. Configure and verify advanced configurations in the routing table and other database tables. Understand and configure Juniper equipment through CLI for basic configurations, secondary system configuration, policies, filters, and firewall.

    Assessment Method: Simulations
    Performance Criteria:

Obtain score of 80% or higher on assignments.

    Assessment Method: Standardized national examinations
    Performance Criteria:

Obtain a score 80% or higher on exam.

Distance vector routing protocols.
Configure, troubleshoot and verify basic EIGRP and apply advanced configuration, verification, and troubleshooting commands with routers implementing EIGRPv4 and EIGRPv6. Design an IP addressing scheme and use advanced configuration commands to implement Enhanced Interior Gateway Protocol (EIGRPv4 and EIGRPv6). Use router show and debug commands to troubleshoot common errors that occur on small to medium routed networks.

    Assessment Method: Simulations
    Performance Criteria:

Obtain score of 80% or higher on assignments.

    Assessment Method: Standardized national examinations
    Performance Criteria:

Obtain a score 80% or higher on exam.

Describe, configure and troubleshoot wireless networks
Identify basic configuration parameters on a wireless network to insure connectivity. Configure a wireless NIC, access point and wireless router. Select the appropriate security protocols to mitigate threats to wireless LANs. Use a systematic approach to wireless LANs troubleshooting to solve access point and firmware issues.

    Assessment Method: Simulations
    Performance Criteria:

Obtain score of 80% or higher on assignments.

    Assessment Method: Standardized national examinations
    Performance Criteria:

Obtain score of 80% or higher on exam questions.

Outline:

Describe, configure and troubleshoot Wireless Technologies.
Hierarchical networks.
Advanced Switching Operations.
Advanced routing troubleshooting.
Distance Vector Protocols.
Manage Cisco IOS® Software licensing and configuration files
Linux Essentials.