Virginia Western Community College
TEL 250
Internetworking III

Prerequisites
TEL 151

Course Description
Studies the advantages of LAN segmentation using bridges, routers, and switches, Fast Ethernet configuring access lists. Covers Spanning Tree Protocol and Virtual LANs

Semester Credits: 4   Lecture Hours: 3   Lab/Clinical/Internship Hours: 3

Required Materials

Textbook:
CCNA Routing and Switching Portable Command Guide, Author: Scott Empson, 4th ed., ISBN: 9781587205880
All reading material is located on netacad.com

Other Required Materials:
Packet Tracer Software (available from the class website)

Course Outcomes

At the completion of this course, the student should be able to:

- Determine how a router will forward traffic based on the contents of a routing table.
- Implement EIGRP.
- Implement OSPF.
- Implement VLANs.
- Implement enhanced switching technologies and first hop redundancy protocols.
- Design a small multi-site business network.

Topical Description

Ch.	Scaling Networks		Objectives
1	**LAN Design**		
	1.1	Campus Wired LAN Designs	Explain why it is important to design a scalable hierarchial network.
	1.2	Selecting Network Devices	Select network devices based on feature compatibility and network requirement.
2	**Scaling VLANs**		
	2.1	VTP, Extended VLANs, and DTP	Configure enhanced inter-switch connectivity technologies.
	2.2	Troubleshoot Multi-VLAN Issues	Troubleshoot issues in an inter-VLAN routing environment.
	2.3	Layer 3 Switching	Implement inter-VLAN routing using Layer 3 switching to forward data in a small to medium-sized business LAN.
3	**STP**		
	3.1	Spanning Tree Concepts	Build a simple switched network with redundant links.
	3.2	Varieties of Spanning Tree Protocols	Explain how different varieties of spanning tree protocols operate.
	3.3	Spanning Tree Configuration	Implement PVST+ and Rapid PVST+ in a switched LAN environment.
4	**Etherchannel and HSRP**		
	4.1	Link Aggregation Concepts	Explain link aggregation operation in a switched LAN environment.
	4.2	Link Aggregation Configuration	Implement link aggregation to improve performance on high- traffic switch links.
	4.3	First Hop Redundancy Protocols	Implement HSRP.
5	**Dynamic Routing**		
	5.1	Dynamic Routing Protocols	Explain the features and characteristics of dynamic routing protocols.
	5.2	Distance Vector Dynamic Routing	Explain how distance vector routing protocols operate.
	5.3	Link-State Dynamic Routing	Explain how link-state protocols operate.
6	**EIGRP**		

	6.1	EIGRP Characteristics	Explain the features and characteristics of EIGRP.
	6.2	Implement EIGRP for IPv4	Implement EIGRP for IPv4 in a small to medium-sized business network.
	6.3	EIGRP Operation	Explain how EIGRP operates in a small to medium-sized business network.
	6.4	Implement EIGRP for IPv6	Implement EIGRP for IPv6 in a small to medium-sized business network.
7	**EIGRP Tuning and Troubleshooting**		
	7.1	Tune EIGRIP	Configure EIGRP to improve network performance.
	7.2	Troubleshoot EIGRP	Troubleshoot common EIGRP configuration issues in a small to medium-sized business network.
8	**Single-Area OSPF**		
	8.1	OSPF Characteristics	Explain how single-area OSPF operates.
	8.2	Single-Area OSPFv2	Implement single-area OSPFv2.
	8.3	Single-Area OSPFv3	Implement single-area OSPFv3.
9	**Multiarea OSPF**		
	9.1	Multiarea OSPF Operation	Explain how multiarea OSPF operates in a small to medium- sized business network.
	9.2	Configuring Multiarea OSPF	Implement multiarea OSPFv2 and OSPFv3.
10	**OSPF Tuning and Troubleshooting**		
	10.1	Advanced Single-Area OSPF Configurations	Troubleshooting Single-Area OSPF Implementations
	10.2	Troubleshooting Single-Area OSPF Implementations	Troubleshoot common OSPF configuration issues in a small to medium-sized business network.

Notes to Instructors

- All instructors are to use a combination of Packet Tracer and hands on labs (via classroom equipment or the Netlab+ online lab server)
- Assignments consist of labs, quizzes, chapter tests, skills based exam, and a final exam