Virginia Western Community College
TEL 151
Internetworking II

Prerequisites
TEL 150

Course Description
Teaches features of the Cisco IOS software, including log in, context-sensitive help, command history and editing, loading software, configuring and verifying IP addresses, preparing the initial configuration of a router, and adding routing protocols to the router configuration.

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

Required Materials

Textbook:
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:

- Implement DHCP on a router.
- Implement network address translation (NAT).
- Implement access control lists (ACLs) to filter traffic.
- Determine how a router will forward traffic based on the contents of a routing table.
- Implement static routing.
- Explain how switching operates in a small to medium-sized business network.
- Configure Ethernet switch ports.
- Implement VLANs.
- Use monitoring tools and network management protocols to troubleshoot data networks.
- Configure monitoring tools available for small to medium-sized business networks.
- Configure initial settings on a network device.

Topical Description

Ch.	Routing & Switching Essentials		Objectives
1	**Routing Concepts**		
	1.1	Router Initial Configuration	Configure a router to route between multiple directly connected networks.
	1.2	Routing Decisions	Explain how routers use information in data packets to make forwarding decisions in a small to medium sized business network.
	1.3	Router Operation	Explain how a router learns about remote networks when operating in a small to medium-sized business network.
2	**Static Routing**		
	2.1	Implement Static Routes	Explain how static routes are implemented in a small to medium-sized business network.
	2.2	Configure Static and Default Routes	Configure static routes to enable connectivity in a small to medium-sized business network.
	2.3	Troubleshoot Static and Default Routes	Troubleshoot static and default route configurations.
3	**Dynamic Routing**		
	3.1	Dynamic Routing Protocols	Explain the function of dynamic routing protocols.
	3.2	RIPv2	Implement RIPv2.
	3.3	The Routing Table	Determine the route source, administrative distance, and metric for a given route.
4	**Switched Networks**		
	4.1	LAN Design	Explain how switched networks support small to medium-sized businesses.
	4.2	The Switched Environment	Explain how Layer 2 switches forward data in a small to medium-sized LAN.
5	**Switch Configuration**		
	5.1	Basic Switch Configuration	Configure basic switch settings to meet network requirements.
	5.2	Switch Security	Configure a switch using security best practices in a small to medium-sized business network.
6	**VLANs**		
	6.1	VLAN Segmentation	Explain how VLANs segment broadcast domains in a small to medium-sized business network.
	6.2	VLAN Implementations	Implement VLANs to segment a small to medium sized business network.

	6.3	Inter-VLAN Routing Using Routers	Configure routing between VLANs in a small to medium-sized business network.
7	**Access Control Lists**		
	7.1	ACL Operation	Explain the purpose and operation of ACLs in small to medium-sized business networks.
	7.2	Standard IPv4 ACLs	Configure standard IPv4 ACLs to filter traffic in a small to medium-sized business network.
	7.3	Troubleshoot ACLs	Troubleshoot IPv4 ACL issues.
8	**DHCP**		
	8.1	DHCPv4	Implement DHCPv4 to operate across multiple LANs in a small to medium-sized business network.
	8.2	DHCPv6	Implement DHCPv6 to operate across multiple LANs in a small to medium-sized business network.
9	**NAT for IPv4**		
	9.1	NAT Operation	Explain how NAT provides IPv4 address scalability in a small to medium-sized business network.
	9.2	Configure NAT	Configure NAT services on the edge router to provide IPv4 address scalability in a small to medium-sized business network.
	9.3	Troubleshoot NAT	Troubleshoot NAT issues in a small to medium-sized business network.
10	**Device Discovery, Management, and Maintenance**		
	10.1	Device Discovery	Use discovery protocols to map a network topology.
	10.2	Device Management	Configure NTP and Syslog in a small to medium-sized business network
	10.3	Device Maintenance	Maintain router and switch configuration and IOS files.

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
- Skill based exam will be used for SLO assessment. This assignment must be completed by every student.