BUTTE COLLEGE
COURSE OUTLINE

I. **CATALOG DESCRIPTION**

CSCI 53 - Cisco Networks Level 2, Routing & Switching **3 Unit(s)**

Prerequisite(s): CSCI 48
Recommended Prep: NONE

Transfer Status: CSU
34 hours Lecture
51 hours Lab

This is an intermediate level computer networks course covering fundamental elements, terminology and software. It is the second of three courses (CSCI 48, 53, and 56) designed to prepare students to take the Cisco Certified Network Associate (CCNA) exam. Course topics include; router elements, binary math, TCP/IP (Transmission Control Protocol/Internet Protocol), addressing, subnetting, address protocols, media standards, and the design of a Local Area Network (LAN).

II. **OBJECTIVES**

Upon successful completion of this course, the student will be able to:

A. Identify and describe the functions of switches.
B. Identify and describe the functions of routers.
C. Define binary IP addressing, sub-netting, address protocols, media standards.
D. Identify the parts in specific protocol address examples.
E. Configure Virtual Local Area Networks (VLANs) and define Inter-VLAN Routing.
F. Differentiate between Static and Dynamic Routing.
G. Formulate and deploy Access Control Lists (ACL).
H. Design and deploy Dynamic Host Configuration Protocol (DHCP) and Network Address Translation (NAT) services.

III. **COURSE CONTENT**

A. **Unit Titles/Suggested Time Schedule**

Lecture

Topics	Hours
1. Introduction to Switched Networks, Basic Concepts and Configuration	4.00
2. VLANs and Inter-VLAN Routing	6.00
3. Router Configuration Files	4.00
4. Static and Dynamic Routing Schemes	6.00
5. Single-Area Open Shortest Past First (OSPF)	2.00
6. ACLs	6.00
7. DHCP and NAT	6.00
Total Hours	34.00

Lab

Topics	Hours
1. Switched Networks, Basic Concepts and Configuration	4.00
2. VLANs and Inter-VLAN Routing	9.00
3. Router Configuration Files	8.00

4.	Static and Dynamic Routing Schemes	9.00
5.	Single-Area OSPF	3.00
6.	ACLs	10.00
7.	DHCP and NAT	8.00
Total Hours		51.00

IV. METHODS OF INSTRUCTION

A. Lecture
B. Collaborative Group Work
C. Homework: Students are required to complete two hours of outside-of-class homework for each hour of lecture
D. Demonstrations
E. Problem-Solving Sessions
F. Practical exercises

V. METHODS OF EVALUATION

A. Projects
B. Homework
C. Lab Projects
D. Written Assignments
E. Written Examinations
F. Practical Examinations

VI. EXAMPLES OF ASSIGNMENTS

A. Reading Assignments
   1. Read the Routing Protocol Selection Guide on the Cisco Support site. Compare and contrast the pros and cons of each routing protocol. Be prepared to discuss in class.
   2. Read the white paper Defeating DDOS Attacks from the link provided by your instructor. Be prepared to explain in class how Access Control Lists can help in prevention.

B. Writing Assignments
   1. Enumerate and explain in a one (1) page document, the purpose of each of the three operating permission environments available in Cisco Routers.
   2. In a one (1) page document, explain what occurs at each step of the router boot sequence.

C. Out-of-Class Assignments
   1. Analyze and compare the IP Route traces to Cisco, Yahoo, and Microsoft. Answer the following questions: What are the differences in the traces? Why are they always the same in the beginning? Did you discover any latency issues and if so, where? Be prepared to share your findings in class.
   2. Analyze and document your home network. Include all devices that have IP addresses or are connected. Submit your work to the instructor.

VII. RECOMMENDED MATERIALS OF INSTRUCTION

Textbooks:

A. Cisco Netacad. Routing and Switching Essentials Companion Guide. 1st Edition. Cisco Press, 2014.
B. Cisco Netacad. Routing and Switching Essentials Lab Manual. 1st Edition. Cisco Press, 2013.

Materials Other Than Textbooks:

A. Access to Cisco Netacad.

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