BUTTE COLLEGE
COURSE OUTLINE

I. **CATALOG DESCRIPTION**

CSCI 48 - Network Fundamentals and Cisco Level 1 **4 Unit(s)**

Prerequisite(s): NONE
Recommended Prep: CSCI 49 and/or Reading Level IV; English Level IV; Math Level III

Transfer Status: CSU
42.5 hours Lecture
76.5 hours Lab

This is an introductory course in computer networking and data communication infrastructure. The focus of this course is to develop the skills required to manage and maintain networks. This is the first of two courses designed to prepare students to take the Cisco Certified Entry-level Network Technician (CCENT) exam and the first of three Butte College courses designed to prepare students to take the Cisco Certified Network Associate (CCNA) Routing and Switching certification exam. Course topics will include: CompTIA Network+ non-proprietary networking, network protocols components, configuration, network design, installation, management and security. Cisco routers and routing, switches and packet switched networks, Internet Protocol addressing and converged networking.

II. **OBJECTIVES**

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

A. Identify and describe standard networks including Local Area Network (LAN), Metropolitan Area Networks (MAN), Wide Area Networks (WAN), and Backbone Network (BN).
B. Identify and describe the functions of the seven layers of the Open Systems Interconnection (OSI) network model.
C. Design basic network topologies and be able to explain the features and functions of the network components.
D. Install, configure, maintain, and troubleshoot network hardware components and protocols.
E. Describe Internet access technologies and physical networking media.
F. Explain the importance of network segmentation.
G. Install and configure a basic firewall, and evaluate network security issues.
H. Develop a multi-platform/operating system integrated network.
I. Develop a physical and logical network topology for a medium sized business.
J. Explain and analyze the challenges of Bring Your Own Device (BYOD) management.
K. Describe virtual networking technologies and Infrastructure as a Service (IaaS).

III. **COURSE CONTENT**

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

Lecture

Topics	Hours
1. Introduction to Networking, and the Internet of Everything	3.00
2. Physical Networking Media, Hardware, and Network Topologies	5.00
3. Networking Standards and the OSI Model	3.50
4. Network Protocols and Access Methods	4.00
5. Networking with Diverse Operating System Platforms and Devices	4.00
6. Network Security Concerns	2.50
7. Layer 1: Signals, Connections and Collisions	2.50

8. Layer 2: Concepts and Technologies	3.00
9. Layer 3: Routing, Routing Protocols, and Addressing	3.00
10. Layer 4: The Transport Layer	2.00
11. Layer 5: The Session Layer	2.00
12. Layer 6: The Presentation Layer	2.00
13. Layer 7: The Application Layer	2.00
14. Design and Documentation	2.00
15. Structured Cabling Project	2.00
Total Hours	42.50

Lab

Topics	Hours
1. Introduction to Networking and The Internet of Everything	5.50
2. Physical Networking Media, Hardware, and Network Topologies	8.00
3. Networking Standards, and the OSI Model	6.50
4. Network Protocols and Access Methods	7.00
5. Networking with Diverse Operating System Platforms and Devices	8.00
6. Network Security Concerns	4.00
7. Layer 1: Signals, Connections and Collisions	3.50
8. Layer 2: Concepts and Technologies	5.00
9. Layer 3: Routing, Routing Protocols and Addressing	6.00
10. Layer 4: The Transport Layer	3.50
11. Layer 5: The Session Layer	3.50
12. Layer 6: The Presentation Layer	3.50
13. Layer 7: The Application Layer	3.00
14. Design and Documentation	4.50
15. Structured Cabling Project	5.00
Total Hours	76.50

IV. **METHODS OF INSTRUCTION**

A. Lecture
B. Homework: Students are required to complete two hours of outside-of-class homework for each hour of lecture
C. Demonstrations
D. Practical exercises

V. **METHODS OF EVALUATION**

A. Lab Projects
B. Written Assignments
C. Written Examinations
D. Practical Evaluations

VI. **EXAMPLES OF ASSIGNMENTS**

A. Reading Assignments
    1. Research the features of a Cisco Catalyst 2960 24 port switch and a HP Procurve 5820 24

port switch. Be ready to discuss the feature similarities and differences with the class.
2. Read the article provided by the instructor about the difference between the World Wide Web and the Internet, and write a one page essay; be prepared to discuss your findings in class.

B. Writing Assignments
1. Write a two page report comparing the TCP/IP networking Model with the OSI Model and the benefits of each. Explain the reasoning behind why they divide the layers differently. Submit your paper to the instructor.
2. Write a two page report on an Internet Pioneer, explain what they did, why they did it, and the impact it has had on development. Present what you learned to the class.

C. Out-of-Class Assignments
1. Visit a local computer retailer. Find out what types of networking equipment they sell and their knowledge of the products. Be prepared to discuss with the class whether that equipment would be adequate for a small or medium size business, and what might be an alternative retailer.
2. Research ISPs in Chico to find pricing, speeds, and availability for Internet access for a small business. Write a paragraph supporting the best service plan.

VII. RECOMMENDED MATERIALS OF INSTRUCTION

Textbooks:

A. Lammle, T . CompTIA Network+ Study Guide. 3rd Edition. Wiley/Sybex, 2015.

B. Cisco Networking Academy. Introduction to Networks. Cisco Press, 2014.

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