

SAN DIEGO COMMUNITY COLLEGE DISTRICT
CONTINUING EDUCATION
COURSE OUTLINE

SECTION I

SUBJECT AREA AND COURSE NUMBER

COMP 608

COURSE TITLE

BASIC NETWORK CONFIGURATION

TYPE COURSE

NON-FEE

VOCATIONAL

CATALOG COURSE DESCRIPTION

This course presents fundamentals in networking and internetworking structure and theory, IP addressing, Binary Mathematics, LAN topologies and architecture, basic network design, cables and cabling standards, and basic electricity. Students will learn through theory and hands on application, the process of understanding basic networking design, operation, troubleshooting, and installation of both the software and hardware associated with networks. (FT)

LECTURE HOURS

40

LABORATORY HOURS

80

ADVISORIES

NONE

RECOMMENDED SKILL LEVEL

10th grade reading level; ability to communicate effectively in the English language; knowledge of math concepts at the 10th grade level; basic computer literacy; normal color perception and above average manual dexterity.

INSTITUTIONAL STUDENT LEARNING OUTCOMES

1. Social Responsibility
SDCE students demonstrate interpersonal skills by learning and working cooperatively in a diverse environment.
2. Effective Communication
SDCE students demonstrate effective communication skills.

INSTITUTIONAL STUDENT LEARNING OUTCOMES (CONTINUED)

3. Critical Thinking

SDCE students critically process information, make decisions, and solve problems independently or cooperatively.

4. Personal and Professional Development

SDCE students pursue short term and life-long learning goals, mastering necessary skills and using resource management and self advocacy skills to cope with changing situations in their lives.

COURSE GOALS

Provide instruction in the theory of operation and design of networks and intranetworks. Students will learn how data travels over a network; how networks operate; how to design a network; LAN and WAN topologies and protocols; configure IP addressing; cut and install various types of cables and basic electricity and safety procedures. Students will learn to develop team building skills by completing assigned group tasks. Completion of these tasks will enhance the students' reading, writing, communication and mathematical competencies. Interpretation of technical terms used in networking and telecommunications technology, both verbal and written is covered.

COURSE OBJECTIVES

Upon successful completion of this course, students will demonstrate through theory and practical application, problem solving, critical thinking, written and oral communication and mathematical ability and that they are able to:

1. Describe the functions of the seven layers of the OSI model.
2. Describe how data travels up and down the OSI model in relation to networks.
3. Use Binary Mathematics.
4. Convert binary, decimal, and hexadecimal digits.
5. Use binary in relation to IP addressing.
6. Describe the use of MAC addresses.
7. Configure IP addresses on hosts.
8. Describe IP Class ranges: A, B, C, etc.
9. Know the difference between a network address and a broadcast address.
10. Describe TCP/IP.
11. Demonstrate the use of LAN topologies (Star, Bus, Ring, and Mesh).
12. Describe LAN/WAN protocols.
13. Demonstrate a knowledge of Windows and Linux servers.
14. Demonstrate knowledge of basic electricity and safety procedures.
15. Demonstrate cable configurations and standards for LANs and WANs.
16. Demonstrate knowledge of different types of cable and the appropriate connectors.
17. Describe basic networking designs of LANs and WANs.
18. Demonstrate how to configure a Network Wiring Closet hardware and premise equipment.
19. Demonstrate how to run horizontal and vertical network cable.
20. Demonstrate how to terminate and test network cable.

SECTION II

COURSE CONTENT AND SCOPE

1. OSI Model
 - 1.1. Purpose:
 - 1.1.1. Host vs. media
 - 1.1.2. Description of layers
 - 1.1.3. OSI layer hardware
2. Binary Mathematics
 - 2.1. Intro to binary numbering
 - 2.2. Comparison to base 2, base 10, and base 16
 - 2.3. Intro to hexadecimal
 - 2.4. Converting binary to decimal
3. Layer Two vs. Layer Three Addressing
 - 3.1. MAC addressing
 - 3.2. IP addressing
4. IP Addressing
 - 4.1. 32 bit Layer 3 addressing model
 - 4.2. IANA IP assignment
 - 4.3. IP Class ranges
 - 4.4. Higher order bit rule
 - 4.5. Host vs. network bits
 - 4.6. Network vs. broadcast address
5. TCP/IP
 - 5.1. Purpose
 - 5.2. Methodology
 - 5.3. Network vs. broadcast address
6. LAN/WAN Platforms
 - 6.1. Windows
 - 6.2. Linux
7. LAN/WAN Topologies
 - 7.1. Star
 - 7.2. Bus
 - 7.3. Ring
 - 7.4. Mesh
8. LAN/WAN Protocols
 - 8.1. Synchronous
 - 8.2. Asynchronous
 - 8.3. Ethernet
9. Networking Media
 - 9.1. NIC cards
 - 9.2. Cables
 - 9.2.1. Coaxial
 - 9.2.2. Twisted pair (shielded and unshielded)
 - 9.2.3. Fiber optic
 - 9.2.4. Miscellaneous

COURSE CONTENT AND SCOPE (CONTINUED)

- 10. LAN/WAN Cabling Standards
 - 10.1. IEEE
 - 10.2. EIA/TIA
- 11. Basic Networking Design
 - 11.1. MDF, IDF, POP
 - 11.2. MCC, ICC, HCC
 - 11.3. Centralized management
 - 11.4. Network wiring closet and hardware
 - 11.5. Premise equipment
 - 11.5.1. Rack
 - 11.5.2. Patch panel
 - 11.5.3. Keystone jack
 - 11.5.4. Raceway
 - 11.5.5. Ladder rack

APPROPRIATE READINGS

Appropriate readings may include, but are not limited to, periodicals, magazines, instructor-written materials, manuals, instructor selected URLs and other publications related to basic networking.

Web Sites:

www.comptia.org

www.howstuffworks.com

<http://en.wikipedia.org/wiki/Wikia>

www.ietf.org/rfc.html

WRITING ASSIGNMENTS

Appropriate writing assignments may include, but are not limited to, preparing text for an assigned project, keeping a journal on all laboratory and project work, completing all assigned reports performing mathematical calculations as assigned, and completing all written assignments.

OUTSIDE ASSIGNMENTS

Outside assignments may include, but are not limited to, reading texts, reference resources or handouts; Internet sites, and research as needed to complete projects and organizing and preparing written answers to assigned questions.

APPROPRIATE ASSIGNMENTS THAT DEMONSTRATE CRITICAL THINKING

Assignments which demonstrate critical thinking may include, but are not limited to, analysis and evaluation of reading assigned text and computer based training materials, utilizing this analysis in classroom discussions, writing assignments, and in performing laboratory activities. Students must select and use appropriate methods and materials needed to complete laboratory assignments.

EVALUATION

A student's grade will be based on multiple measures of performance. The assessment will measure development of independent critical thinking skills and will include evaluation of student's ability to:

1. Perform the manipulative skills of the craft.
2. Apply theory to laboratory assignments.
3. Complete all appropriate computer based training assignments.
4. Perform successfully on all written, oral, or practical examinations.
5. Contribute to class discussions.
6. Maintain attendance per current policy.

Satisfactory completion of the course requires completion of a culminating activity, which may include, but is not limited to, one of the following:

1. Written report.
2. Classroom presentation.
3. Practical lab projects, which include practical demonstrations of LAN and WAN configurations, LAN and WAN cable configurations and installation and networking wiring closet hardware and premise equipment.

Upon successful completion of each individual course a Certificate of Course Completion will be issued. Upon successful completion of all courses included in the program a Certificate of Program Completion will be issued.

METHOD OF INSTRUCTION

Methods of instruction will include, but are not limited to, lecture, self-paced lab simulators, demonstration, individualized study, use of multimedia materials, group/team work, tutorials, and other unique instruction requirements, such as, outside assignments, field trips, and guided student job assignments.

This course, or sections of this course, may be offered through distance education.

TEXTS AND SUPPLIES

Texts:

LabSim for Network+ Guide, Course Technology, current edition

Supplies:

Notebook paper, USB drive

PREPARED BY Carol L. Akey DATE August 27, 1999

REVISED BY Don Aragon and Maria Reyes DATE February 17, 2007

REVISED BY Instructional Services/SLO's Added DATE May 30, 2013

REVISED BY Don Aragon and Richard Gholson DATE May 6, 2020

Instructors must meet all requirements stated in Policy 3100 (Student Rights, Responsibilities and Administrative Due Process), and the Attendance Policy set forth in the Continuing Education Catalog.

REFERENCES:

San Diego Community College District Policy 3100
California Community Colleges, Title 5, Section 55002
Continuing Education Catalog