

SAN DIEGO COMMUNITY COLLEGE DISTRICT
CONTINUING EDUCATION
COURSE OUTLINE

SECTION I

SUBJECT AREA AND COURSE NUMBER

COMP 600

COURSE TITLE

INTRODUCTION TO NETWORKING

ALTERNATE NAME

CISCO ACADEMY COURSE 1;
BASIC NETWORKING

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 network cabling. Students will learn through theory and hands on application. (FT)

LECTURE HOURS

40

LABORATORY HOURS

80

ADVISORIES

NONE

RECOMMENDED SKILL LEVEL

10th grade reading level; the ability to communicate effectively in the English language; the knowledge of math concepts at the 10th grade level; basic computer literacy; normal color perception and an 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 routers, switches and other devices operate; how to design a network; how network topologies and protocols work. Students will be able to explain the functions of the OSI model layers and configure IP addressing. Students will be able to cut and install various types of cables and adhere to basic electricity and safety procedures. This course will prepare the student to take certification exams like the CCNA Certification Exam (Cisco Certified Network Associate). Students will learn to show a spirit of cooperation and teamwork 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. Students who successfully complete this course will be prepared to move on to the next phase of networking training, which can include the Cisco Networking Academy in preparation to take the CCNA Certification Exam.

COURSE OBJECTIVES

Upon successful completion of this course, students will demonstrate through theory and practical application, problem solving, critical thinking, written and oral communication, mathematical ability and the following skills and knowledge:

1. Describe the seven layers of the OSI model.
2. Describe the functions of the seven layers of the OSI model and TCP/IP model.
3. Describe how data travels up and down the OSI model and TCP/IP model.
4. Describe the OSI and TCP/IP model layer devices.
5. Use Binary Mathematics.
6. Use hexadecimal numbering system.
7. Convert binary to decimal.
8. Describe the function and use MAC addresses.
9. Describe and create IP addresses.
10. Configure IP addresses and convert the addresses to binary.
11. Describe IP Class ranges: A, B, C, etc.
12. Describe the difference between a network address and a broadcast address.
13. Describe TCP/IP, including IPv4 and IPv6 addressing and show how subnetting is accomplished.
14. Configure subnet IP addresses and describe subnet masking.

COURSE OBJECTIVES (CONTINUED)

15. Demonstrate an understanding of LAN topologies (Star, Bus, Ring, Mesh and Hierarchical).
16. Demonstrate a knowledge of basic electricity and safety precautions.
17. Describe cable configurations and standards.
18. Demonstrate network cable configurations.
19. Design a basic network.
20. Configure Wiring Closet hardware and premise equipment.
21. Setup horizontal and vertical cable.
22. Terminate and test cable.

SECTION II

COURSE CONTENT AND SCOPE

1. OSI Model
 - 1.1. Host vs. media
 - 1.2. Description of layers
 - 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. Converting binary, decimal, and hexadecimal
3. Layer Two vs. Layer Three Addressing
 - 3.1. MAC addressing
4. IP, IPv4 and IPv6, Addressing
 - 4.1. 32 bit and 128 bit layer 3 addressing models
 - 4.2. Internic (Regional Internet Providers) and ISP (Internet Service Providers) assignment
 - 4.3. Classes: IP class ranges
 - 4.4. Higher order bit rule
 - 4.5. Host vs. network bits
 - 4.6. Network vs. broadcast address
5. TCP/IP, Including IPv4 and IPv6, Subnetting
 - 5.1. Purpose
 - 5.2. Methodology
 - 5.3. Function and purpose of IP network prefixes
 - 5.4. Network vs. broadcast address
6. LAN Topologies
 - 6.1. Star
 - 6.2. Bus
 - 6.3. Ring
 - 6.4. Mesh and hierarchical
7. Networking Media
 - 7.1. Cables
 - 7.2. Coaxial
 - 7.3. Twisted pair (shielded and unshielded)

COURSE CONTENT AND SCOPE (CONTINUED)

- 7.4. Fiber optic
- 7.5. Miscellaneous
- 8. Cabling Standards
 - 8.1. IEEE
 - 8.2. EIA/TIA
- 9. Basic Networking Design
 - 9.1. Introduction to HCC (Horizontal Cross Connect), VCC (Vertical Cross Connect), and Backbone Wiring
 - 9.2. Centralized management
 - 9.3. Wiring closet and hardware
 - 9.4. Premise equipment
 - 9.5. Rack
 - 9.5.1. Patch panel
 - 9.5.2. Network jack
 - 9.5.3. Raceway
 - 9.5.4. Ladder rack

APPROPRIATE READINGS

Appropriate readings may include, but are not limited to, periodicals, magazines, instructor-written materials, manuals, instructor selected URL's, and other publications related to design and implementation of networks.

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 mathematic 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 that demonstrate critical thinking may include, but are not limited to, analysis and evaluation of reading assigned text and online materials and utilize 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.

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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:

EVALUATION (CONTINUED)

1. Perform the manipulative skills of the craft, as required.
2. Apply theory to laboratory assignments.
3. Complete all online lessons.
4. Successfully complete all online exams.
5. Successfully complete the online final exam.
6. Successfully perform on written, oral, or practical examinations.
7. Successfully complete all assigned hands-on labs.
8. Contribute to class discussions.
9. Maintain attendance per current policy.

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

1. Skills based assessment.
2. Classroom presentation.
3. Practical lab projects, which include practical demonstrations of cable configurations and installation and 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 in the program a Certificate of Program Completion will be issued.

METHOD OF INSTRUCTION

Methods of instruction will include, but not limited to, lecture, on-line instruction and curricula, self-paced lab, hands-on labs, instructor demonstration, demonstration, individualized study, use of multimedia presentations, group/team work, tutorials, and other unique instruction requirements, such as, outside assignments, field trips, and guided student job assignments.

TEXTS AND SUPPLIES

Texts:

Cisco Network Academy First Year Companion Guide, Cisco Press, current edition
Cisco Network Academy Engineering Workbook, current edition

URLs:

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www.cisco.com
www.cisco.netacad.net
TEXTS AND SUPPLIES (CONTINUED)

Supplies:

Personal storage device

PREPARED BY Carol L. Akey DATE August 2, 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 Richard Gholson/Don Aragon DATE January 13, 2014

REVISED BY Richard Gholson/Don Aragon DATE January 28, 2015

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