

**PALOMAR COLLEGE**  
**COURSE OUTLINE OF RECORD FOR**  
**DEGREE CREDIT COURSE**

  X   Transfer Course     X   A.A. Degree applicable course  
(check all that apply)

**COURSE NUMBER AND TITLE:** CSIS 134      Network Voice and Data Cabling

**UNIT VALUE:** 4

**MINIMUM NUMBER OF SEMESTER HOURS:** 80 hrs

**BASIC SKILLS REQUIREMENTS:** Appropriate language and computational skills.

**ENTRANCE REQUIREMENTS**

**PREREQUISITE:** CSIS 108 or R CSIS 56 and CSIS 111

**COREQUISITE:** None

**RECOMMENDED PREPARATION:** None

**SCOPE OF COURSE:**

The course is designed for students interested in the physical aspects of voice and data network cabling and installation. The course focuses on cabling issues related to data and voice connections and provides an understanding of the industry and its worldwide standards, types of media and cabling, physical and logical networks, as well as signal transmission. It includes network design documentation, part list set up and purchase, pulling and mounting cable, cable management, choosing wiring closets and patch panel installation and termination as well as installing jacks and cable testing. Also included are design documentation, and installation issues, as well as laboratory safety, on-the-job safety, and working effectively in group environments.

**SPECIFIC COURSE OBJECTIVES:**

The successful student will be able to:

- I. Identify and understand the cabling industry and standards.
- II. Demonstrate and explain media and transmission practices.
- III. Explain and understand installation theory.
- IV. Demonstrate and explain practical installation.
- V. Demonstrate knowledge of the future of cabling products and installation.

## **CONTENT IN TERMS OF SPECIFIC BODY OF KNOWLEDGE:**

### **I. Industry and Networking Overview**

- a. Cabling Industry and Standards
  - i. Introduction to Cabling
  - ii. The Cabling Job Market
  - iii. National and Local Safety Codes and Standards
  - iv. International Safety and Code of Conduct
  - v. Basic Lab Safety Principles Safety and Code of Conduct

### **II. Media and Transmission Practices**

- a. Signals and Wires
  - i. Signal Transmission
  - ii. Basics of Electrical Theory
  - iii. Electronic Characteristics of Cable
  - iv. Basics of Optical Theory
  - v. Basic Wireless Systems Theory
  - vi. Signals on Networks
  - vii. High-Bandwidth and Backbone Signals
  - viii. Signal Degradation
- b. Copper Media
  - i. Overview
  - ii. Twisted-Pair
  - iii. Twisted-Pair Cable Fundamentals
  - iv. Other Twisted-Pair Configurations
  - v. Standards
  - vi. Coaxial Cable
  - vii. Outside Plant Cables
- c. Fiber Optic Media
  - i. Fiber Optics
  - ii. Modes
  - iii. Dispersion
  - iv. Attenuation (Insertion Loss)
- d. Introduction to Networking
  - i. Networking Overview
  - ii. Network Topologies
  - iii. OSI Model Overview
  - iv. Physical Layer Functions
  - v. Data Link Layer Functions
  - vi. Network Layer Functions
  - vii. Transport Layer Functions
  - viii. Application, Presentation and Session Layer Functions

### **III. Installation Theory**

- a. Standards
  - i. Introduction to Cabling Standards
  - ii. Worldwide Standards Organizations
  - iii. US Standards
  - iv. Local US Codes
  - v. Canadian Standards
  - vi. Japanese Standards

- vii. Australian and New Zealand Standards
- viii. European Standards
- b. Structured Cabling Basics
  - i. What is a Structured Cabling System?
  - ii. Building Entrances
  - iii. Equipment Rooms and Telecommunication Rooms
  - iv. The Main Distribution Facility (MDF) or Main Cross Connect
  - v. The Intermediate Distribution Facility (IDF) or Telecommunications Room
  - vi. Cross-Connects – Main, Vertical or Intermediate, Horizontal
  - vii. Work-Area Cabling
  - viii. Patch Cords
  - ix. Other Premises Distribution Systems
- c. Tools of the Trade
  - i. Tools of the Trade
  - ii. Tool Usage and Material Handling
  - iii. Professionalism

#### **IV. Practical Installation**

- a. Cabling Presales/ Sales Phase
  - i. Overview
  - ii. Request-for-Proposals
  - iii. Pre Bid Meeting and Bid Creation
  - iv. Requirements Gathering
  - v. Labor Cost Calculation
  - vi. Material and Labor Issues
  - vii. Contract Development , Negotiations and Planning
  - viii. Communication and Conflict Resolution
  - ix. Software Tools
  - x. Icons and Symbols
  - xi. Types of Design Documents
- b. Cabling Rough-In Phase
  - i. Rough-In Phase Overview
  - ii. Rough-In Support Tools
  - iii. Horizontal Cable Installation
  - iv. Vertical Cable Installation
  - v. Roughing-In of other Cabling Types
  - vi. Firestops
  - vii. Upgrades and Retrofits
- c. Cabling Trim Out Phase
  - i. Trim Out Phase Overview
  - ii. Cable Management
  - iii. Terminating Copper Media
  - iv. Fiber Optic Termination
  - v. Fiber Optic Connectors
  - vi. Fiber Optic Splicing
  - vii. Additional Technical Information
  - viii. Patch Panels
  - ix. Upgrades and Retrofits
- d. Cabling Finish Phase
  - i. Finish Phase Overview
  - ii. Cable Testing

- iii. Cable Troubleshooting
- iv. Cable Certification
- e. Cabling Customer Support Phase
  - i. Cabling Project Completion Overview
  - ii. Customer support
  - iii. Customer Support Job Functions
  - iv. Customer Support Materials
  - v. Determining Upgrade Opportunities

**V. Future of Cabling Products and Installation**

- a. Emerging Cabling Technologies
  - i. Emerging Cabling Technology Overview
  - ii. High-Speed Internet Access
  - iii. Residential Cabling
  - iv. Wireless Networking and Cabling
  - v. Voice over IP Technologies

**REQUIRED READING:** Texts appropriate for the course, such as the following:

Cisco Systems, Inc. Cisco Networking Academy Program: Fundamentals of Voice and Data Cabling Companion Guide, 1<sup>st</sup> edition. Indianapolis, IN: Cisco Press. 2001

Cisco Systems, Inc. Cisco Networking Academy Program: Fundamentals of Voice and Data Cabling Lab Manual, 1<sup>st</sup> edition. Indianapolis, IN: Cisco Press. 2001

**SUGGESTED READING:** None

**REQUIRED WRITING:** Problem solving exercises and skills pertaining to cable installations demonstrated in computer homework and lab assignments. A minimum of one page per homework assignment is required.

**OUTSIDE ASSIGNMENTS:** Students are expected to spend a minimum of three hours per unit per week in class and on outside assignments, prorated for short-term classes.

**INSTRUCTIONAL METHODOLOGY:**

**Check all that apply:**

- lecture
- laboratory
- lecture-laboratory combination
- directed study

**DISTANCE LEARNING:**

**This course may be offered as a distance learning course and meets Title 5 regulations 55370, 55372, 55374, 55376, 55378, and 55380.**

Yes  No

**If yes, check all that apply:**

- Television Course (Video one-way, e.g. ITV, video cassette, etc.)
- Online Course (Text one-way, e.g. newspaper, correspondence, electronic file, etc.)
- Two-Way Video Conferencing (Two-way interactive video and audio)
- One-Way Video Conferencing (One-way interactive video and two-way interactive audio)
- Computer Assisted Instruction (A specialized form of mediated instruction relying primarily on student access to information and prepared lessons or teaching materials through a computer terminal, but not under immediate supervision of a qualified instructor.)

**GRADING POLICY AND STANDARDS** (include methods of determining whether the stated objectives have been met by students): Grades for courses are based upon final examinations, mid-term examinations, other tests, assignments, projects, and participation. Faculty will inform students of their grading policy at the beginning of each semester.

50-60%	Assignments
40-50%	Examinations

**IS COURSE REPEATABLE FOR REASON(S) OTHER THAN DEFICIENT GRADE?**

Yes  No  Number of times course may be taken for credit: N/A

If yes, identify specific provision of Title 5 Division 2 section(s), 55761-55763 and 58161 which qualifies course as repeatable: N/A

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<b>SIGNATURES ON FILE</b>
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