# COURSE OUTLINE

## ELEC-140

## Network Cabling Systems

### 3 Credits

# HOWARD COMMUNITY COLLEGE

**Description**

This course is designed to train individuals in the fundamentals of installing, connecting and certifying network cabling systems. Students will learn to apply the basics of network cable and connector selection, installation and termination. Fundamental testing, certification, and documentation practices will be covered. Labs include hands-on experience with terminating and testing coaxial, unshielded twisted pair (UTP), and fiber optic cables in accordance with current industry and EIA/TIA standards. (2 hours lecture, 3 hours lab)

**Overall Course Objectives**

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

1. Define basic network terms and components.
2. Interpret and use EIA/TIA standards for network cable installations.
3. Select and use proper tools for network cabling, such as: punch down tools, crimping tools, fiber termination and splicing tools.
4. Demonstrate proper pulling and routing procedures for network cables in trays, conduits and wiring closets.
5. Install and terminate coax (Thinnet), UTP (10 base T), and fiber cables.
6. Assemble coax (Thinnet), UTP (10 base T) and fiber connectors.
7. Demonstrate network cable test equipment.
8. Test and certify network cable systems.
9. Document the network cable installations.

**Major Topics**

I. Network Terminology or Concepts
   - A. Network Components
   - B. Network Topologies and Protocols
   - C. Network Operating Systems
   - D. Plant Facilities and Site Installation Considerations

II. Metal Conductors and Connectors
   - A. Coaxial Cable Parameter and Testing
   - B. Unshielded Twisted Pair Parameters
   - C. Installing Metal Cables in New and Existing Facilities
   - D. Hands-on Exercises Terminating RG58 Coax and CAT 5 UTP Cable
   - E. Test the Assembled Cable System

III. Certifying and Troubleshooting Metal Cable Systems
   A. Certifying Standards and Contractual Agreements
   B. Hands-on Experience on Testing Coaxial Cable Assembly
   C. Hands-on Experience on UTP Cable Assembly

IV. Fiber Cable Parameters and Terminology
   A. Propagation, Scattering, Attenuation, Loss
   B. Power Budget
   C. Noise Immunity, Security
   D. Segment Length, 10BaseF, 10BaseFL, FOIRL, FDDI
   E. Insulation/Cladding Considerations: Fire Safety, Environmental, Direct Burial

V. Type of Fiber in Network
   A. Multimode vs. Single Mode Fiber
   B. Use of Backbone Fiber
   C. Installing Fiber Cables in New and Existing Facilities
   D. Employ Safe Work Practice When Installing and Terminating Fiber Cables

VI. Assemble, Test, Certify and Troubleshoot Fiber Cables
   A. Hands-on Exercises Terminating Fiber Cable With ST and SC Connectors
   B. Hands-on Exercise Examining Polish With a Microscope
   C. Hands-on Exercise Testing Total Loss of the Completed Cable
   D. Measure Assembled Cable Length and Loss Measurements (Use of OTDR)
   E. Troubleshoot Problems in Fiber Cables

## Course Requirements

Grading/exams: Grading procedures will be determined by the individual faculty member but will be calculated on the basis of tests, lab reports, quizzes and final exam. This course includes a comprehensive final exam.

Writing: Each week, students are expected to write a laboratory report after performing that week=s assigned experiments.

## Other Course Information

This course is a course in the Electronics Technology and Telecommunications Technology programs.