

ATCW-1210: INTRODUCTION TO INFORMATION TRANSPORT - COPPER

Cuyahoga Community College

Viewing: ATCW-1210 : Introduction to Information Transport - Copper

Academic Term:

Spring 2019

Subject Code

ATCW - AIT-Communication Workers

Course Number:

1210

Title:

Introduction to Information Transport - Copper

Catalog Description:

Advanced certification course covering in depth skills, transmission mediums and applied administration tasks required for industry proficiency. In addition, installation of copper cable systems in conjunction with industry standards will be covered. Training to lead installers to be self sufficient and able to start, run and complete small copper projects.

Credit Hour(s):

2

Lecture Hour(s):

2

Requisites

Prerequisite and Corequisite

Departmental approval: admission into the CWA apprenticeship program.

Outcomes

Course Outcome(s):

I. Demonstrate the skills, preparations, tools and equipment required for the information transport industry proficiency certification for copper medium installations.

Objective(s):

1. Identify the skills required for industry certification.
2. Define terms specific for copper medium.
3. List the tools used for systems installation and testing.
4. Identify skills required to read and interpret basic blue prints and scope of work.
5. Explain the required proficiency testing process required for industry certification.

Course Outcome(s):

II. Examine the transmission mediums, fundamentals and safety precautions used in conjunction with industry codes of standards required for structured copper cable systems installations.

Objective(s):

1. Develop basic skill sets required to manage other installers on the job sites.
 2. Discuss the code of conduct mandated by the industry to maintain professionalism on the work site.
 3. Describe the different transmission mediums used in copper cabling systems.
 4. Identify the transmission fundamentals required to match correct mediums with signal types.
 5. List the worker protection safety regulations required for cable systems installations.
 6. Identify industry codes and standards specific to copper mediums.
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Course Outcome(s):

III. Install copper cable systems with respect to prescribed industry methods and procedures.

Objective(s):

1. Perform installation site surveys and develop appropriate job plans.
 2. Review the prescribed requirements required to properly pull and position copper wire for installations and apply as recommended.
 3. Identify termination requirements with respect to manufacture's specifications and comply with testing parameters throughout installations.
 4. Employ copper cable testing and troubleshooting requirements for proper installation verification.
 5. Differentiate between retrofit, upgrades and moves, adds and changes (MAC).
 6. Identify advanced installation requirements involving retrofits and apply as prescribed.
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Course Outcome(s):

IV. Perform administrative tasks and respective duties for cabling infrastructure.

Objective(s):

1. List the administrative tasks related to copper cabling infrastructure.
 2. Define the terms used with respect to structured cabling systems.
 3. State the scope of proper labeling.
 4. Discuss the procedures that are to be followed for recordkeeping.
 5. Differentiate between operational and maintenance benefits.
 6. Develop skills to interact directly with the customer or project manager.
 7. Develop skills to enable the accomplishment of the expected end result.
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Methods of Evaluation:

1. Quizzes
2. Tests
3. Class participation

Course Content Outline:

1. Copper medium/proficiency certification
 - a. Installation skills
 - i. Copper wire installation
 - ii. Copper terminations
 - iii. Sizes and capability of copper mediums
 - iv. Splicing copper cable
 - v. Interpret color code
 - b. Terminology for copper medium
 - i. Copper wire installation
 - ii. Feed copper cables
 - iii. Wire gauge Punch down
 - iv. Fusion
 - v. Grounding
 - vi. Fill ratios
 - c. Tools
 - i. Hand tools
 - ii. Power tools
 - iii. Testing tools
 - d. Testing tools
 - i. Time domain reflectometer TDR
 - ii. Optical
 - iii. Toner generator/continuity tester
 - iv. Land tester
 - v. Multimeter
 - vi. Butt set
 - e. Testing process

- i. Industry standards
 - ii. Compliance testing
 - iii. Continuing education
 - f. Job site skills
 - i. Blue print reading
 - ii. Scope of work
- 2. Copper transmission mediums, fundamentals and safety
 - a. Mediums
 - i. Signal content
 - 1. Data
 - 2. Voice
 - 3. Voltage
 - i. Pathway
 - 1. Twisted pair
 - 2. Coaxial copper
 - 3. Shielded twisted pair
 - b. Fundamentals
 - i. Medium selection
 - ii. Signal type
 - iii. Outside plant cable installations
 - iv. Industry standards
 - v. Environmental
 - c. Safety regulations
 - i. Occupational Safety and Health Administration (OSHA)
 - ii. National Electrical Code (NEC)
 - iii. Local ordinances
 - iv. Customer policies
 - v. Lockout/ tag out
 - vi. Environmental Protection Agency
 - vii. Confined space
 - d. Codes and standards
 - e. Code of conduct
 - i. Personal professionalism
 - ii. Union ethics
 - iii. Customer relations
 - f. Job site management
 - i. Product security
 - ii. Maintenance inventory
 - iii. Tools & equipment
- 3. Copper installation
 - a. Site survey
 - i. Location identification
 - ii. Customer needs
 - iii. Pathways
 - iv. Penetrations
 - v. Suspensions
 - vi. Medium identification
 - vii. Height requirements
 - viii. Fire stopping
 - ix. Fill ratios
 - x. Bonding
 - xi. Grounding
 - b. Prescribed requirements
 - i. Specifications
 - ii. Job expectations
 - c. Terminations
 - i. Industry standards
 - ii. Customer needs
 - iii. Circuits

- 1. Primary
- 1. Secondary
- iv. Troubleshooting
 - 1. Continuity
 - 2. Voltage
 - 3. Pathways
 - 4. Manufacturer warranty
 - 5. Performance
- v. Retrofit, upgrades and MAC
 - 1. Standard
 - 2. Environmental
 - a. Asbestos
 - b. Lead
- 4. Administrative tasks
 - a. Tasks
 - i. Labeling
 - ii. Bill of material
 - iii. Documentation
 - iv. Reports
 - v. Test data
 - vi. Supply coordination
 - 1. Overages
 - 2. Shortages
 - b. Labeling scope
 - i. Component identification
 - ii. Pathways
 - iii. Equipment
 - iv. Fire stop penetrators
 - c. Recordkeeping procedure
 - i. Manual
 - ii. Computer based
 - iii. Maintenance
 - iv. MAC
 - d. Benefits
 - i. Operational
 - 1. MAC
 - 2. As built
 - ii. Maintenance
 - 1. Repairs
 - 2. Tests
 - 3. Damage locator
 - e. Cable testing recordkeeping
 - i. Simple
 - ii. Complex
 - iii. End user
 - iv. Compliance
 - v. Maintenance
 - vi. Manufacturer specifications
 - f. Professional Skill set
 - i. Customer
 - ii. Project manager
 - iii. Supervision
 - g. Project outcome
 - i. Customer expectation
 - ii. Actual end result

Resources

BICSI. *Telecommunications Cabling Installation IN225*. V 6.1. BICSI Tampa, Florida, 2012.

BICSI. *Information Technology Systems Installation, ITSIMM*. 6th Edition. BICSI Tampa, Florida, 2012.

Independent Electrical Contractors Chesapeake and Western Electrical Contractors Association. *Electrical Pre-Apprenticeship Workforce Development*. 2013 Edition. Cengage Learning Clifton Park, NY, 2013.

National Fires Association (NFPA). *National Electric Code 2011 (NEC)*. 2011 Edition. NFPA Quincy, Massachusetts, 2010.

Resources Other

www.uniquefirestop.com

www.cablinginstall.com

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