



# West Virginia State Community and Technical College



West Virginia State Community and Technical College is regionally accredited with the North Central Association and is a Servicemembers Opportunity College.

## Data Cabling

### CATALOG DESCRIPTION:

This 60 hour course is designed to provide the necessary skills to function in the telecommunications career area. The course covers: safety, standards and practices, facility issues, ratings and performance, installation, testing, and troubleshooting.

### COURSE OBJECTIVE:

To provide each student with the skills and knowledge to perform basic design, installation, maintenance, and troubleshooting of data cabling systems.

### COURSE LEARNING OUTCOMES:

In order to achieve the primary course objectives and provide students an opportunity to further their general educational knowledge and skills, as the course progresses and upon completion of the course the students should be able to:

- Perform data cabling task in a safe manner
- Differentiate between voice and data signals
- Define the characteristics of shielded and unshielded twisted pair
- Define the characteristics of thick and thin net coaxial cable
- State the advantages that come from establishing industry cabling standards
- Describe the operation of the telephone system used in the United States.
- Identify the physical topologies, and state the advantage and disadvantage of each
- Describe the color coding used in telephone installations
- List the accepted logical topologies
- Given a specific application, identify the grade of cabling that would be required
- Identify Type-66 and Type-110 insulation displacement connectors
- Identify the various types of modular jacks that are commonly used with telecommunications systems
- Determine the location of the entrance facility
- Identify the demarcation point
- Define horizontal cabling
- Describe backbone cabling
- List different types of backbone cable systems, and describe their attributes
- Describe a cross connect panel
- Describe procedures associated with proper cable management
- Differentiate between a channel and a basic link
- Identify standard tests that should be performed on CAT5 cable runs to certify them
- Describe the functions typically associated with cable testing
- Describe the steps associated with testing and certifying basic links and channels
- Describe various ANSI/TIA/EIA standards for commercial buildings and residential settings
- Recognize and use standard grounding and bonding requirements for
- Telecommunications equipment
- Describe documentation methods that are used for cabling in a commercial building
- Differentiate between the installation techniques of pulling cable versus blowing cable
- Define the terms "tensile strength" and "jam ratio"
- Describe the importance of the coefficient of friction with regard to cable installations
- Demonstrate how to calculate the jam ratio for a three-cable pull

- Given the inner diameter of the conduit and the outer diameter of the cable, determine the likelihood as to which configuration a three-cable pull will resume
- Contrast between water-based and silicone-based pulling lubrication
- Describe the structure of the local telephone exchange
- Describe each of the BORSCHT functions
- Explain the differences between the telephone exchange classifications
- Describe the electrical characteristics of PAM, PDM, PCM, and DM
- Describe the advantage of companding
- State the companding technique used in the United States and Europe
- Analyze attenuation delay, and line conditioning on a voice-channel
- Interpret attenuation delay charts for conditioned lines
- Explain the services offered thru T1, T2, T3 and T4 connections
- Design the network by identifying the availability of local T1 access
- Describe the services available with SONET connection
- While planning a customer's job, study technology options, pro and con
- Identify the technical capabilities of T-Carrier, SONET and multiplexing

#### COURSE LAB OUTCOMES:

- Properly terminate a CAT5 UTP cable onto CAT5 compliant TJ45 termination jacks using the T568A configuration.
- Properly terminate a CAT5 UTP cable onto CAT5 compliant TJ45 termination jacks using the T568B configuration.
- Properly terminate CAT5 UTP cable with two RJ45 modular plugs, using the T568A configuration.
- Properly terminate CAT5 UTP cable with two RJ45 modular plugs, using the T568B configuration.
- Properly terminate a 50 ohm RG58 coaxial cable using two BNC connectors.
- Properly calibrate the Level II tester, perform a self test and document the results.
- Test previously created patch cables using the Level II tester, and document the results.