

Hands-On

CAT 5/6 & Fiber Optic Installer



BICSI CECs

This course has been approved for CEC credits by BICSI. Please read below for a breakdown of the credits that we offer for this course. For more information regarding BICSI please visit our website.

RCDD: 21	OSP: 21	Inst: 21	Tech: 21	Cert. Trainer: 21
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Course Description

BTS recognizes that installers and or contractors often have a difficult time getting certified and getting the Hands-On experience needed to do the job. To many courses are focused toward test and exam questions, rather than the understanding and Hands-On Skill-Set to do the job inline with today's standards and competencies.

Our Certification Course to become an CAT 5 6 and Fiber Optic Certified Installer is designed to get attendees up to speed quickly on industry standards, provide proper installation, knowledge and get Hands-On training that covers the latest standards, tools, and techniques used today's cable installations, and give them the ability to represent themselves as "CAT 5 6 and Fiber Optic Certified Installer."

Attendees will be taught how to properly splice fiber, both fusion and mechanical, test and troubleshoot a fiber system. Also, in todays enviornments technicians need to be able to properly inspect and repair faulty connectors. A portion of this course is used to cover termination techniques and testing of connectors, patch cords and couplers.

Many of the systems used today will also include portions of Cat 5 and 6 cabling. Like the Fiber Optic systems, this bit rate is dramatically increasing giving the importance of proper

installation and testing of these systems. This course will cover the transmitting capabilities of Cat 5 and 6 cable, proper termination and testing a data system. Those who complete this course will be productive and knowledgeable in both Fiber Optic and Category 5 and 6 cabling.

BTS's Certification Course to become an BTS Certified Installer is BICSI accredited course. It is taught by SME certified structured cable specialists with over 25 years of industry experience that includes network installations/upgrades for Telephone Companies, Power & Energy Companies, United States Federal & State Governments, School Districts, and major U.S. Corporations.

By completing this course you will earn 21 Continuing Educational Credits that could be applied to your BICSI continued education program. Our SMEs have the field experience to find the answers to real live scenarios, providing students with a Real-World Experience.

Attendees each get a Certification Certificate, and I.D. Card

Benefits

- Receive (21) continuing educational credits CECs from BICSI that can be used towards other educational goals.
- Maximize system performance and reliability by learning today's installation techniques.
- Be aware of current industry standards, and become a trusted resource for your customer.
- Gain customer confidence by ensuring the integrity of their installations/support.
- Hold a Certification Installer Card that represents your Certification and BICSI CECs.
- BTS Certificate and I.D. card remains on electronic record and can be confirmed and reissued at any time.
- This Certification is Nationally and Internationally Recognized.

Students Will Learn

- Fiber Optics Overview-Refresher.
- Fiber Optic Theory And Waveguide Functions.
- Singlemode (OSP) And Multimode (ISP) Fiber Types.
- The Causes Of Attenuation, Optical Reflection And Refraction.
- Optical Dispersion Characteristics And Pulse Spreading Issues.

- Loose Tube And Unitube Style Trunk Cables
- Distribution And Feeder Cables.
- Fusion Splicer Applications And Fiber Alignment Systems
- Mechanical Splicing Uses And Applications
- Optical Connector Styles And Applications
- Back Reflection Issues And Angled Physical Contact Connectors
- Patch Panels And Functions For Distribution And Transmission
- ISP/OSP Style Splice Closure Styles And Function
- Cable Entry Methods And Splitter Configurations
- Cable Installation Methods As Direct Bury, Aerial And Ducted
- Safety Practices
- Intro To Optical Testing And Troubleshooting.
- Visible Light Sources, OTDRs And Power Meters
- Testing Methods For ISP/OSP Systems
- OTDR Test Functions And Trace Interpretation
- Optical Loss Testing Methods
- Category 5 & 6
- Industry Standards
- Project Planning
- Architectures and Installations
- Tools and Components
- Cable Building
- Termination
- Certified Testing
- Troubleshooting
- And More...

Target Audience

Persons who will be building, installing, terminating, and testing Category 5 and 6 and Fiber Optic cabling.

Prerequisites

Basic electrical concepts. This information can be obtained in our Basic Electricity and Telephony courses. Basic hands-on skills and be able to pass a color-blindness test.

Course Outline

MODULE I: FIBER OPTIC GENERAL STUDIES

INTRODUCTION

- Common Industry Terminology
- History of Fiber Optics
- Advantages/Disadvantages of Fiber Optics
- Basics of a Fiber Optic Communications System
- Typical Transmission Rates for Voice, Video & Data Applications
- System Topologies
- Fiber Optic Standards

THEORY TOPICS

- Theory of Light
- Electromagnetic Spectrum
- Total Internal Reflection
- Singlemode and multimode characteristics
- Index of Refraction (Refractive Index)
- Light Source's (LED's & LASER's)

- Wave Division Multiplexing (WDM)
- Optical Switching Fundamentals

FIBER TOPICS

- Optical Fiber Types
- Typical Fiber Specifications
- Multimode Optical Fibers
- Singlemode Optical Fibers
- Dispersion Characteristics
- Modal Dispersion
- Chromatic Dispersion

FIBER CABLE TYPES

- Outside Plant
- Inside Plant
- Loose tube Gel Filled (OSP)
- Tight Buffered Distribution (ISP)
- Tight Buffered Breakout (ISP)
- Jumper Cables and Hybrids styles
- Reverse Oscillation Locator (OSP)
- Fiber Color Code

MODULE II: FIBER OPTIC SAFETY ISSUES

SAFETY FIRST

- LASER Safety and Warning labels
- Types of LASER's
- LASER Output Power Levels
- Eye Safety Precautions
- Safe Glass Disposal Practices
- Food and Drinks Not Safe
- Proper Person Cleanliness
- Safe Work Surroundings
- Confined Spaces Issues

MODULE III: FIBER OPTIC CABLE INSTALLATION

PROPER PLANNING

- Project Considerations
- Cable Pre-testing
- Cable Reels Identification and Handling
- Proper Cable Pulling Techniques
- Outdoor Cable Design Characteristics
- Direct Bury Cable Installation
- Directional Boring Methods
- Buried Cable Depths

- Man Holes and Vaults
- Cable Pulling Specifications
- Tensile Strength and Bend Radius
- Avoiding Installation Obstacles
- Grounding and Bonding Fiber Cables
- Identifying Cable Types
- Work Area Protection Issues
- And More...

MODULE IV: FIBER OPTIC CONNECTORS

- Connector Types
- Use of connectors
- ST Style Connector Assembly; Hand and/or Machine Polishing and Inspection
- SC Style Connector Assembly; Hand and/or Machine Polishing and Inspection
- * Proper termination and testing of connectors

TESTING CONNECTORS AND JUMPER LOSS

- Measure loss of previously installed connectors
- Test loss of jumpers
- Fiber Testing Parameters
- Continuity Testing

MODULE V: FIBER OPTIC SPLICING

- Mechanical and Fusion Splicing
- Fusion Splicer Types and Operations
- Precision Cleaver Operation
- Set-up Fusion Splicer and Cleaver Work Stations
- Practice Fiber Stripping, Cleaning and Cleaving
- Practice In-Line Fusion Splicing
- Practice Pigtail Fusion Splicing
- Qualify Acceptable Splices

MODULE VI: FIBER OPTIC ENCLOSURES

- Closures used if Fiber Optics Splicing
- How to properly open and install cables
- How to dress fibers in a splicing tray

MODULE VII: FIBER OPTIC TESTING

* The dB Scale and Units of Loss

- OTDR Functions for Testing
- OTDR Testing for Splices, Distances and Back Reflection
- OTDR Trace Guidelines
- The Dead Zone
- Trace Events and Interpretation
- Testing at Various Wavelengths
- System Loss Parameters

- Calculating System Loss
- Total System OTDR Testing
- Optical Loss Test Set's (OLTS)
- Referencing the Test Set First
- Measuring Cable System Loss
- Documenting Test results

MODULE VIII: CATEGORY 5 and 6 CABLE

- Project planning
- Codes and standards
- Installation DO'S and DON'TS
- Architectures and Installations
- Tools and Components
- Connector types
- Certified Testing Procedures
- Architectures and Installations
- Tools and Components
- Cable Building
- Termination
- Certified Testing
- Troubleshooting

Notes

OTDR, Power Meter and Light Source
Visible LASER Light Source
Fiber Inspection Microscope
Fusion Splicer
CAT 5/6 Cable Tester (Certified)

Wire Mapper
3M Hotmelt
Seicor Unicam
Pentascanner
110 Punchdown
Wire Verifier
Cross-Connects
Patch Panels
Wall Outlet/Jacks
And more

Delivery Method

Instructor-led with Hands-On labs and exercises throughout the course.

Equipment Requirements

(This apply's to our hands-on courses only)

BTS always provides equipment to have a very successful Hands-On course. BTS also encourages all attendees to bring their own equipment to the course. This will provide attendees the opportunity to incorporate their own gear into the labs and gain valuable training using their specific equipment.

Course Length

3 Days