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

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 then 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 BISCI 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 Sources (LEDs & LASERs)

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 LASERs

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 Sets (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 DOS and DONTS
- 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