Hands-On

CAT 5/6 & Fiber Optic Installer T-T-T

Train-The-Trainer

Course Description

This Hands-On 5-day (or 4-day 10 hrs. per day) course will train-the-trainer and a group of participants how to become an CAT 5-6 and Fiber Optic Certified Installer.

Train-The-Trainer Will include the following

1. The instructor candidates (CAT 5-6 and fiber experience is required) will attend the first 2 days of the course that consists of two parts

A) First 2 days covering the course materials and how to deliver the training.
B) 2-3 days of co-teaching. In other words, the instructors will co-teach a live course of students.

2. Instructor Delivery-Course-Agenda Will receive a detailed course description with timelines and benchmarks for the delivery format of this course.

3. Course Manual Will receive a hardcopy and digital .pdf copy of the training course manual with unlimited use license.

4. Lab Documentation Will receive a detailed documented lab guide.

5. A list of required equipment needed and facility layout for a successful training program.

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 today's environments 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. 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. 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

-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.
-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

Instructor candidates must have CAT 5-6 and Fiber Optic experience. Basic electrical concepts. This information can be obtained in our Basic Electricity and Telephony courses. Basic telecommunications 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

OTDRs, Power Meter and Light Source
Visible LASER Light Source
Fiber Inspection Microscope
Fusion Splicers
CAT 5/6 Cable Testers (Certified Throughput)
Wire Mappers
3M Hotmelt
Seicor Unicam
Termination Kits
Pentascanner
110 Punchdown
Wire Verifier
Cross-Connects
Patch Panels
Wall Outlet/Jacks
Hand Tools and more...

Delivery Method

Instructor-Led with numerous Hands-On Labs and exercises and can incorporate any type of customer equipment in to the Hands-On lab environment.

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

5 Days