

Hands-On

Fiber To The Home - FTTx

Installation, Testing, And Troubleshooting (Active and Passive)



Course Description

This Hands-On 2-day course (3 Days if the prerequisites are not met) is designed to benefit those requiring an introduction to the principles and applications of Passive and Active Optical Networking and Fiber Systems including Fiber to the X (FTTx) applications, and their associated equipment and testing requirements and methods using an effective mix of classroom and Hands-On to help participants Lockdown a complete understanding of the equipment, testing, and tasks to be undertaken in real-life situations.

The students will use state-of-the-art test equipment such as the, Viavi ONX-580 OneExpert, EXFO, Fluke, etc., Meters, and incorporate any meter(s) that students can bring to the session to use during the hands-on lab procedures throughout the course and will be used during the Hands-On lab exercises to reinforce Real-World Experience.



BTS does provide some gear for the labs, but it is always best to get training on what you will be using.

Students Will Learn

- **Active And Passive FTTH Applications**
- **Overview Of Systems Installation Of FTTH**
- **A Quick Overview Of Splicing**
- **Connectors And Terminations**
- **PON Cabinets And Closures**
- **Testing FTTH From The Remote To The ONU**
- **Testing The Fiber And Light Levels To The Customer Premise**
- **Troubleshooting headend & Network Elements/OLT-ONT**
- **Testing With OTDR And PON Power Meters**
- **Differences Between PON And Standard Power Meters**
- **And More...**

Target Audience

Technicians, installers, splicers, contractors, union craftsman, facilities managers, telecom managers, electricians, and anyone involved in repairing, installing, maintaining, designing, evaluating, or provisioning ACTIVE and PASSIVE FTTH systems.

Prerequisites

A basic understanding of telecommunications and intermediate knowledge of fiber optics are recommended prior to taking this course. The prerequisite Essential Fiber Optics and Testing training are available as an additional BTS courses.

This is a fairly fast-paced course Attendees must have the prerequisite fiber optic experience or training or equivalent knowledge of the topics covered in Module I.

Module I is a refresher only, and prior training and/or knowledge is expected.

Course Outline

Module I: Fiber OPTIC Refresher

Fiber Optic Theory And Waveguide Functions

Singlemode And Multimode Fiber Types.

The Causes Of Attenuation

Optical Reflection And Refraction

Optical Dispersion

The Three Basic Elements Of Fiber Optic Systems & Discuss Their Uses.

Loose Tube And Unitube Cables

Distribution And Feeder Cables.

Fiber Color Code

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
Entrance Facility Design And Specifications
OSP/Pons Style Splice Closure Styles And Function
Cable Entry Methods And Splitter Configurations
Drop Cable Connectivity And Security
Cable Installation Methods As Direct Bury, Aerial And Ducted
Safety Practices (General And Fiber Optic Specific)
Using A Power Meter And Light Source Test Loss Budget Of The System

Module II: PON Systems & Active-E Applications

xPON Network Design Features
Standards and Work Groups as FSAN, ITU & IEEE
xPON Architectures as APON, EPON, BPON, GPON, FTTH/ FTTx/ PON
Optical Return Loss (ORL)
Link Budget, Reach & Split Ratio
Topologies for Urban and Rural communities
PON System End Equipment Splitters, ONU/ONTs, OLTs, ODNs
xPON Transmitters and Receivers

Module III: FTTx Construction and Splicing Overview

Site and Fiber Safety
Closure Types used in FTTx Applications
Proper OSP Cable Installation
Proper Closure Preparation
Fiber Prep For Splicing

Splicing Single Pigtails

Splicing Fiber Drop

Module IV: FTTx Testing

Testing Methods for PONs Networks

Expected Loss vs. Actual Loss

PON OTDR Testing Through Splitters

PON Optical Loss Testing (Light Source, PON Power Meters)

Calculating a Loss and Power Budget

Delivery Method

Instructor led with numerous Hands-On labs and exercises.

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

2 Days