

Hands-On

# Advanced Fiber Optics

Testing & Troubleshooting



## Course Description

This Hands-On Advanced course is designed to give Technicians a more in-depth procedure of testing and troubleshooting long line and fiber to the home systems.

Completion of this intense course prepares the Tech to understand all aspects of fiber optics, focusing on equipment used to test and troubleshoot fiber systems.

This is an Advanced course, attendees are expected to have the understanding of Basic Fiber Optics, Splicing and Terminating Fiber Cables. This course will cover Advanced Testing and Troubleshooting of Fiber Optics Systems in today's competitive and challenging industry. A trip to the field to perform actual Live Hands-On Testing and Troubleshooting will be arranged, if applicable and weather conditions are acceptable.



Attention Attendees

Bring any equipment to the training that can benefit you by incorporating your own type of equipment into the Hands-On labs during this training. BTS provides gear for the labs, but it is always best to be trained on what you will be using.

## Students Will Learn

- **PON and ACTIVE Network Designs**
- **How TDM and WDM is used in FTTH Applications**
- **In-depth use of an OTDR for Testing and Troubleshooting**
- **Understanding Probable Faults in a Fiber System Attenuation, Return Loss, Back Reflection, Refraction**
- **Active/PON(FTTx) Qualification and Troubleshooting**
- **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 basic fiber optic splicing, termination and testing is required prior to taking this course. This information can be obtained in our courses below

Basic Telephony & TeleCom Electronics

Hands-On Fiber Optic ISP / OSP

Essential Fiber Optics

## Course Outline

**Students must have the prerequisite (BTS Hands-On Fiber ISP/OSP Combo course) or equivalent knowledge of Basic Fiber Optics, splicing and termination. This familiarization is expected and required prior to taking this course.**

### Module: 1 Advanced Fiber Optic Systems

- PON network design features
- Active network design features
- WDM technology and how its used in FTTH
- And more

### Module: 2 Advanced Test Accepting and Troubleshooting Fiber Systems

- Understanding attenuation
- Causes of attenuation
- Testing attenuation at different wavelengths
- Understanding back reflection
- Understanding return loss
- APC (Angled Physical contact) connector verses UPC connectors back reflection
- Optical dispersion characteristics and pulse spreading issues
- Power testing levels for FTTH
- And more...

### Module: 3 Advanced Testing & Meters Used in Fiber Systems

- OTDR use
- Setup of the OTDR

- Identifying OTDR traces
- 2 point and 4 point OTDR test
- Testing at different wavelengths
- Measure fiber length, loss and back reflection
- Measure to events and how to add landmark events
- Setup of the Power meter and light source
- Interpreting PM and Light source results
- Using the visible light sources
- And more

#### **Module: 4 Active/PON(FTTx) Qualification and Troubleshooting**

- Testing Methods for PON/Active networks
- PON wavelength and (I of R) refractive index OTDR setup
- OTDR testing at different wavelengths for ACTIVE systems
- OTDR testing at different wavelengths for PON systems
- OTDR testing through splitters for PON systems
- Loss budget for PON and ACTIVE systems
- Testing for adequate power levels for FTTH systems
- And more

### **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