

Course ID
LIGHTMST
Course Duration
3-5 days

Course Title
LightMASTER Certified Fiber Optic Training

Related Courses

- Optical Networking for Professionals, Managers, and Executives (OPTNET, 2-3 days)
- SONET/SDH: Principles and Design (SONET-SDH, 2 days)
- DWDM: An Introductory Tutorial (DWDM101, 2 days)
- DWDM Principles and Design: An Advanced Tutorial (DWDM, 2-3 days)

Aimed At

This course is aimed at network, cable, and equipment installers supporting telecommunications service provider and enterprise fiber optic users.

Group Size

7-16

Prerequisites

Those wishing to take this course should have a basic knowledge of network cable installation, troubleshooting, measurement, repair, and validation techniques.

Course in a Nutshell

We created this course to meet the needs of system installers, technicians, outside plant personnel, and electrical contractors tasked with the important job of converting local-loop facilities from traditional copper to state-of-the-art fiber optic technology. An intensive five-day program, it consists of two days of theory lecture and three days of hands-on laboratory work. The lab exercises were created to simulate the actual field environment.

The course may be used to prepare the participants for the Electronic Technician Association (ETA)'s Fiber Optic Installer (FOI) examination. This important industry certification is portable, valid for four years, renewable and recognized worldwide as an indicator of professional competence. When thus employed, it includes an aggressive test preparation component with 150 practice questions and examples that reinforce and unify the theory and lab exercises into a keener understanding of the fiber optics field. The FOI examination can be included in the course fees and administered on the last day of the class.

Customize It!

We can customize this program to your own network architecture, cabling, equipment, tooling or testing requirements. We can also include or exclude the test preparation/administration portion depending on your training objectives, resulting in a shorter or longer course.

Learn How To

- Understand the theory of fiber optic transmission
- Describe the components of a fiber optic link
- Perform validation testing and troubleshooting using fiber optic test and measurement equipment
- Perform cable preparation, termination, and splicing
- (Optional) Prepare and sit for the Fiber Optic Installer (FOI) examination, a portable and industry standard certification administered by Electronic Technicians Association International (ETA-I).

Course Outline

Theory of Fiber Optics (2 days)

- Fiber to the Home (FTTH) Architecture
 - Fiber Pair Gain Systems
 - Deployment Options
 - Passive Optical Network (PON)
- The Basics of Fiber Optics
 - Advantages of Fiber Optics over Copper Cabling
 - Frequency, Wavelength, and the Speed of Light
 - The Electromagnetic Spectrum
 - Reflection and Refraction
 - Index of Refraction
 - Total Internal Reflection
- Optical Waveguides
 - Numerical Aperture
 - Multimode and Singlemode Fibers
 - Step and Graded Index Profiles
- Transmission Characteristics
 - Attenuation
 - Macrobending and Microbending
 - Dispersion
 - Gain/Bandwidth Product
- Optical Link Components
 - Light Sources (LED, VCSEL, Laser)
 - Photodiode Receivers (PIN, APD)
 - Indoor and Outdoor Cables (Tight Buffer, Loose Tube)
 - Connectors (ST, SC, FC, LC)
 - Optical Splitters
 - Splices (Fusion and Mechanical)
- System Design
 - Decibel and Percentage Gain and Loss

- Loss Budget
- Link Loss Calculation
- System Margin
- Safety Procedures
 - Fiber Handling and Disposal
 - Laser Classes
 - Chemical Handling
- Termination Methods
 - Cable Preparation
 - Connector Styles
 - Epoxy, Crimp, Pre-loaded, Chemical, UV-Curable
 - Cleaving and Preparation
 - Polishing and Visual Inspection
 - Splicing (Fusion and Mechanical)
- Test and Measurement Equipment
 - Visual Fault Locator
 - Optical Loss Testing
 - Optical Time Domain Reflectometer (OTDR)
 - Testing Methodologies (Fiber Optic Test Procedures)
- Fiber Optic Installer Examination Preparation
 - Practice Questions and Exercises
 - Group Preparation
 - Test Administration

Laboratory Exercises (3 days)

1. Fabricate and Test a 2 Meter Multimode ST to ST Jumper
 - Cable Preparation (Jacket and Buffer Stripping)
 - Connector Attachment (Pre-loaded Adhesive)
 - Cleaving
 - Polishing and Inspection
 - Testing Using a Multimode Optical Loss Test Set
2. Fabricate and Test a 2 Meter Multimode ST to SC Jumper
 - Cable Preparation (Jacket and Buffer Stripping)
 - Connector Attachment (Heat Cure and Anaerobic Epoxy)
 - Cleaving
 - Polishing and Inspection
 - Testing Using a Multimode Optical Loss Test Set
3. Fabricate and Test a 2 Meter Singlemode ST to FC Jumper
 - Cable Preparation (Jacket and Buffer Stripping)
 - Connector Attachment (Heat Cure Epoxy)
 - Cleaving
 - Polishing and Inspection

- Testing Using a Singlemode Optical Loss Test Set
- 4. Perform and Validate a Mechanical Splice
 - Cable Preparation (Jacket and Buffer Stripping)
 - Cleaving
 - Align Fiber Segments in Mechanical Splice and Adjust to Maximize Throughput
 - Testing Using a Multimode Optical Loss Test Set
- 5. Perform and Validate Fusion Splices
 - Familiarization with Fusion Splicer Features and Functions
 - Fiber Preparation and Cleaving
 - Perform Low-loss Fusion Splices
 - Apply Tensile Test to Validate Splice Quality
- 6. Utilize a Singlemode Optical Time Domain Reflectometer for Troubleshooting a Fiber Link
 - Familiarization with OTDR Features and Functions
 - Attach a Pulse Suppressor and Test Box
 - Perform Measurements at 1310 and 1550nm Wavelength
 - Dead Zone, Reflective and Non-reflective Event Locations, Event Loss, Total Link Loss and Length

How You Will Learn

- You will learn from an industry expert with 30+ years of hands-on field expertise.
- If your training objective is passing the Fiber Optic Installer (FOI) examination, you will engage in aggressive test preparation with 150 practice questions and examples. You will also take the examination on the last day of the class.
- You will receive a comprehensive participant handbook that will serve as a valuable reference back on your job.

Revised

February 27, 2012f