41 Locke Rd., Concord, NH 03301
Phone: 603-226-2400 / Fax: 603-226-2410
www.fibernext.com

Certified Fiber Optic Technician (CFOT); WAN/OSP
3-day Hands-On Training Program Course Description

In this fast paced program, students will learn the fundamentals of fiber optic transmission theory from the ground up. Beginning with safety and handling, students will then be exposed to all of the elements in a typical WAN/Outside Plant fiber optic network including the various cable types, connectors, interconnecting hardware, installation methodologies and industry standards used in this market. Students will also be trained on the types of equipment used to test and troubleshoot Outside Plant fiber optic cable networks. The program also includes extensive fusion splice restoration techniques for damaged cables. The program is highlighted by hundreds of samples from dozens of industry manufacturers and incorporates a series of hands-on labs to expose students to the fundamentals of outdoor cable installation, preparing loose tube cables for termination, installing fiber connectors at demarc panels, fusion splicing fiber cables in OSP enclosures and testing fiber systems with OTDRs and OLTS testers designed for WANs.

The program is founded on Electronics Industries Alliance (EIA), Telecommunications Industry Association (TIA), Institute of Electrical and Electronics Engineers (IEEE), International Telecommunications Union (ITU) and Telcordia standards. Students learn the methodologies used in designing, selecting, implementing, terminating and testing fiber optic cable networks following the standards set forth by such organizations. The program is also recognized by both BICSI and the Fiber Optic Association (FOA) as an accredited training course and, as such, these organizations offer certification and credits for attendants. It is a hands-on certification class worth 7 BICSI continuing education credits (CEC's) per day equating to a total of 21 BICSI credits for the 3-day program. Students will also receive color training catalogs, a certificate of involvement and a CFOT industry certification from the Fiber Optic Association upon completion, based on a written exam grade of 70% or higher. The exam is delivered on the third day of training.

Topics covered in this program include such subject matter as an overview of fiber optic jargon, interconnection hardware, cable types and preparation, network loss budgets, fusion splicing, mechanical splicing, fiber cable preparation, installing fanout/breakout kits, installing fiber into patch/splice enclosures, laser optimized networks, OTDR testing, troubleshooting intricate fiber optic networks and much more. The delivery method utilized for this program includes a mixture of PowerPoint lecture, exposure to hundreds of material samples and instructor led hands-on labs and exercises each day.

- **Who should attend?** Anyone looking for a thorough understanding of fiber optic infrastructure systems including installers, aerial cable installation technicians, IT managers, systems designers, facility managers, LECs/CLECs, ITS professionals, telecom service technicians and more.
- **Student Prerequisites:** None (although a background in telecommunications, computer networking or cabling systems is strongly recommended but is not required)
- **Student Certification:** Obtained by taking the written CFOT exam on the third day of the program (included in the course price). Students must receive an exam score of 70% or higher to achieve FOA CFOT certification.
- **Classroom Ratio:** 60% lecture, 40% hands-on labs.
- **Accreditations:** FOA CFOT Certification and 1-year membership into the FOA as well as 21 BICSI continuing education credits for all BICSI members that attend.

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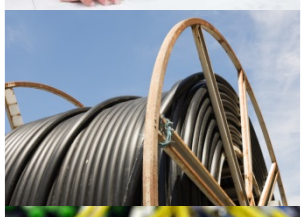
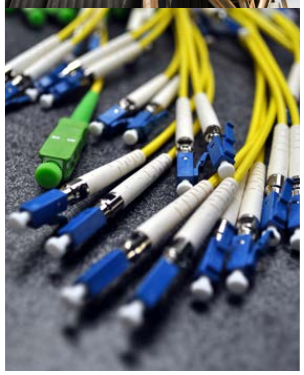
Topics To Be Covered, Day 1:





- Fiber optic safety practices
- WAN networking fundamentals
- The metric system and its comparative empirical conversions
- The basic components that comprise a fiber optic network
- Various types of optical fibers
- The various methods of manufacturing optical fiber
- Signal propagation characteristics within optical strands
- Optical dispersion characteristics and pulse spreading
- The electromagnetic spectrum and its fiber optic applications
- Water peak phenomenon and attenuation profiles within optical fibers
- Industry standards and the National Electric Code (NEC)
- Fiber optic cable types and proper installation methods
- Fiber optic connector styles (form factors)
- Introduction to fiber optic hand tools for termination
- Cable preparation lab for various cable styles, indoor/outdoor
- Installation lab for assorted connectors on various cable types

Section 1: Fiber Optic Safety
Fiber optic glass
Isopropyl alcohol and solvents
Laser exposure

Section 2: Fiber Optic Theory
Industry "standards" vs. "codes"
Benefits of fiber vs. copper
Metric system conversions
Fiber optic link components
Manufacturing glass performs (MCVD, etc.)
Optical fiber cross section
Single-mode fiber characteristics
Chromatic dispersion
Signal propagation

Section 3: Optical Networking
Network design types, WAN, PON
Light sources and Cone of acceptance
Electromagnetic spectrum
Causes of attenuation
EIA/TIA fiber attenuation limits

Section 4: Fiber Optic Cables
Universally adopted TIA fiber optic color code
NEC Article 770-50; fire safety code
Fiber cable classifications
Fiber cable types and applications

Section 5: Pathways and Spaces
Aerial Cable types and installation overview
Underground Cable types and installation overview
Conduit requirements & sub-ducts

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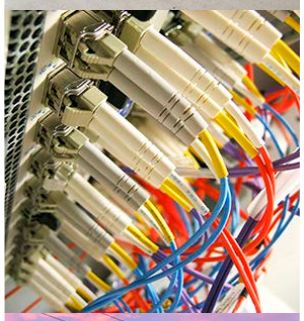
Section 6: Fiber Optic Connectors
Anatomy of a fiber optic connector
Various connector styles including: ST, SC, FC, LC, MTRJ, MU, etc.
Connector selection matrix

Section 7: Fiber Optic Tools
Safety aids and procedures
Cable slitting and ringing
Cutting tools and stripping tools

Section 8: Cable Prep and termination (Lab)
Installation of SC Quick connector types
End face inspection
Cleaning fiber optic connectors
Pre-polish/No epoxy connector assembly (i.e. UniCam, FAST, etc.)

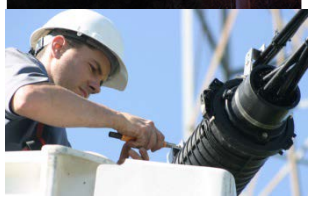
Topics To Be Covered, Day 2:

- Network design considerations
- The causes and symptoms of attenuation
- The causes and symptoms of insertion loss
- The causes and symptoms of optical return loss
- Dynamic range and loss budget calculations WAN (Hands on)
- Optical loss testing methods and tools (Hands on)
- Tier 1 network certification (Hands on)
- Real world polarity issues (Hands on)
- Troubleshooting techniques, i.e. Visual Fault Locator, etc.
- Trouble shooting simulated fiber optic networks (Hands on)
- OTDR functionality (Hands on)
- OTDR set up and operation (Hands on)
- In depth OTDR trace analysis



Section 1: Optical Fiber Theory (Review/Expanded)
Fiber optic link components
Metric Measurements and conversions
Physical characteristics of fiber
Bandwidth of optical fiber
Gigabit Ethernet specifications
Electromagnetic spectrum
Types of light sources and their attributes
Water peak (attenuation) profiles

Section 2: Network Design Considerations
Simplex networks and duplex polarity
Loss budget calculations
Transmission application loss limits



Section 3: Terms and Units of Testing Optical Loss
Testing terms and definitions
dB vs. dBm unit comparison
Power conversions from (x)w to dBm
EIA/TIA optical fiber loss over span specifications

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Section 4: Tier 1 Network Testing (Power Meter & Source)
Types of power meters and light sources
Referencing methods

Section 5: Tier 1 Network Testing (Certification Test)
Types of "certification" test sets
OLTS Testing on WANs
End-face geometry and optical return loss (ORL)

Section 6: Troubleshooting Tools and Techniques
Fiber identifiers
Visual fault locators and continuity testing
Fiber optic talk sets
Handheld and video fiber microscopes

Section 7: Tier 2 Testing with OTDR (Optical Time Domain Reflectometer)
OTDR types and features
OTDR functionality
Use of launch and receive cables
Proper system set up and testing parameters
Trace result analysis
File/PC storage






Topics To Be Covered, Day 3:

- Fiber cleaving technologies
- Fiber cleaving (hands on)
- Fusion splicing technologies
- Fusion splicing process (hands on)
- Single fiber splicing (hands on)
- Ribbon fiber splicing overview
- FuseConnect and SOC connector systems overview
- Splicing and termination hardware and apparatus
- Fusion splice trays and accessories
- Adapter plates and panel accessories

Section 1: Fusion Splicing
Modern V-Groove style splicing equipment
Modern FTTX style splicing equipment
Modern Core align style splicing equipment

Section 2: Fiber Cleaving
Basic hand held cleavers & variability
Precision cleavers

Section 3: Single Fiber Splicing
Mechanics of a single fiber fusion splicer
Splicer set up and operation
V groove vs. Core align splicer fundamentals
Splice quality evaluation
Individual splice protection

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Section 4: Mass/Ribbon Fiber Splicing
Mechanics of a ribbon fusion splicer overview
Ribbon fiber cable stripping and cleaving overview
Hands-on labs of ribbon splicing

Section 5: Patch and Splice Apparatus
Equipment cabinets, racks and associated hardware
Cable management in racks and demarcation areas
Indoor wall and rack mount patch panels
NEMA rated wall mount patch panels
NID boxes and demarc hardware
Pedestals and hand holes
FTTX Enclosures, OptiTap® and FiberTap®
Adapter plate inserts
Butt & In-line style splice enclosures (various)
Splice trays for various apparatus
Labs for fusion splicing in OSP enclosures

Section 6: OSP Cable Hardware
Conventional strand and lash materials
ADSS Cable hardware
Slack storage shows and types
Pole-mount cable storage
OPGW hardware

Section 7: FOA CFOT Exam
Exam preparation and review
Administer the written exam

Call Toll Free and Enroll Today at 866-470-6398! Classes form regularly across the Northeastern US