Hands-On

Fiber Optics Designer

Certifications for ETA (FOD) or FOA (CFOS/D)

Course Description

This Hands-On course will cover the particulars of how fiber optic networks are designed within the context of complete communications systems or construction projects and provide an in-depth knowledge of all aspects of a successful fiber optic system.

The focus is geared on the design from network protocols, network configurations, optical cabling, industry communications standards, determination of fiber count, hardware selection, splicing/termination methods, and cable system testing/troubleshooting and proper documentation.

This Fiber Optics Designer course provides detailed instruction and Hands-On labs of fiber optic design throughout the course.

Certification(s)

ETA (FOD) Fiber Optic Designer or FOA (CFOS/D) Certification can be administered during this course, upon request.

Students Will Learn

- **Fiber Optic Design Overview**
- **Physical Plant Layout**
- **Network Protocols**
- **Network Configurations**
- **Optical Cabling**
- **Industry Communications Standards**
- **Determining Fiber Count**
- **Hardware Selection**
- **Splicing**
- **Termination**
- **Cable Systems**
- **Testing**
- **Troubleshooting**
- **Fiber Counts/Types**
- **Link Loss Calculation**
- **Proper Documentation**
- **And More...**

Target Audience

This course is intended for contractors, installers, architects and engineers, project managers and all others who are involved with projects that include fiber optics.

Prerequisites

A basic understanding of telecommunications.
This information can be obtained in our courses below or equivalent knowledge

-TeleCom Networks Today
-Basic Telephony & Telecom Electronics

Course Outline

1. Theory And Principles of Fiber Optics

- Principles of Operation
- System Parameters

2. Optical Sources

- LED
- Vertical Surface Emitting Lasers (VCSELs)
- Lasers
- Modulation

3. Fiber Types

- Multimode
- Restricted Mode Launch Bandwidth
- Laser Optimized Multimode
- Single-mode

4. National Electrical Code

- Building Environments
- Cable Ratings
- Cost Comparison Model

5. Cable Selection in Network Design

- Cable Construction
- Recommended Cable Types
- Cable Selection
- Lab/Case Study 1

6. Termination and Splicing

- Termination Methods
- Fusion Splicing Methods
- Mechanical Splicing
- Loss Analysis

7. Hardware

- Areas and Types
- Hardware Selection Factors
- Main Cross Connect
- Intermediate Cross Connect
- Horizontal Cross Connect
- Telecommunications Room
- Work Areas
- Hardware, Connectors, and Splicing

8. ANSI/TIA/EIA Building Codes

- Commercial Building Telecommunications Cabling Standard (TIA/EIA-568-B)

9. ANSI/TIA/EIA Engineering Updates

- Administration Standard for the Telecommunications Infrastructure (TIA/EIA-606)
- Engineering Subcommittees Update

10. Ethernet

- Open Systems Interconnection (OSI) Model
- 10Mbps Ethernet
- Carrier Sense Multiple Access/Collision Detection (CSMA/CD)
- 100Mbps Ethernet
- 1000Mbps Ethernet
- 10 Gigabit Ethernet
- Differential Mode Delay

11. Fiber Distribution Data Interface (FDDI)

- FDDI Functionality
- Optical Cabling for FDDI

12. Fiber Channel

- Architectures
- Applications
- Standards

13. Asynchronous Transfer Mode (ATM)

- ATM Model
- ATM Migration Path
- Optical Cabling for ATM

14. Voice Networks

- Voice Signal Digitization
- Multiplexing Techniques
- Optical Cabling

15. Video

- Security Video
- Conference Video
- Community Antenna Television (CATV)

16. Network Cabling Design

- Structured Cabling
- Interbuilding Cabling
- Intrabuilding and Horizontal Cabling
- Distributed vs. Centralized Cabling
- System Redundancy

17. Data Center Design

- Anatomy of a Data Center
- Functional Areas
- Protocols
- Solutions

18. Cross Connect Design

- Cross Connect Design
- Rack Layout
- Fiber Management

19. Cable Support System Design

- Ladder Rack Systems
- Raceway

20. Internetworking

- Network Components
- Design Considerations

21. Logical Network Topologies

- Point to Point
- Ring
- Star
- Mesh

22. Designing a Full Service Network

- Physical Plant Layout
- Customer Requirements
- Physical Topology
- Fiber Counts/Types

23. Optical Testing and Measurements

- Reasons for Testing
- Types of Test Measurements
- Testing Guidelines
- Link Loss Calculation

Notes

Certifications
ETA (FOD) or FOA (CFOS/D) Certification is available for this course upon request.

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

3 Days