

Fiber Optics for Mining Applications


 NEW

Course Description

This three-day class has been developed with 12 hours of classroom training and 12 hours of hands-on skills labs that provide the practical understanding and skills required to properly design, install, and maintain fiber-optic systems in underground and surface mines. Attendees will use the latest fiber optic technology and equipment to learn how to splice, connectorize, test, and troubleshoot harsh-environment optical fiber networks in order to increase efficiency, reliability, and on-the-job safety as well as reduce production costs and downtime.

Course Level

Introductory to intermediate. Novices to experienced fiber technicians find the class and extensive hands-on skills training beneficial.

Course Options

Three days – Classroom lecture and hands-on exercises.



COURSE FEES

- Three-day course \$1500
- Optional ETA Fiber Optic Installer (FOI) Exam \$150

Certification

ETA Fiber Optic Installer



Complete the three-day Fiber Optics for Mining course and pass the ETA Fiber Optic Installer (FOI) certification exam. The FOI is designed for those working with both multimode and single-mode fibers.

Classroom (12 Hours)

Introduction to Fiber Optics
Standards and Terminology
Fiber Optic Applications

Fiber Theory
Basic Optical Theory
Attenuation, Reflection, Dispersion

Optical Fibers
Single-mode Fiber Types
Multimode Fiber Types
Fiber Selection

Fiber Optic Cable
Cable Design and Types
MSHA-rated Cables
Cable Specifications

Connectors
Connector Types
Termination Techniques
Inspection and Cleaning

Splicing
Fiber Optic Cleaving
Fusion Splicing
Splice Protection

Cable Management
Panels and Closures

Installation
Route Planning
Cable Handling
General Guidelines

Optical Testing
OTDRs
Optical Loss Testing
Testing Terminal Equipment
Visual Inspection

Restoration/Maintenance
Typical Causes of Failure
Restoration Planning
Underground Restoration

Safety
Light Sources • Fibers
Chemicals • Installation

Active and Passive Devices
Lasers, VCSELs, and LEDs
Detectors
Repeaters
Couplers and Switches

Analog and Digital
Reflection Issues

System Design
Design Objectives
Optical Loss Budgets
Safety Margins
Material Lists

System Standards
IEEE 802 Standards
CCTV Specifications

Hands-on (12 Hours)

Station #1 – Cable Preparation
MSHA-rated Distribution Cables
MSHA-rated Breakout Cables
MSHA-rated Loose Tube Cables
Cable Mid-entries
Closure and Panel Preparation

Station #2 – Splicing
Splice 250- and 900- μ m Fibers
Fiber Handling and Cleaving
Fusion Splicing
Fusion Splicer Adjustments

Station #3 – OTDR Operation
Operate an OTDR
Reflection Testing
Acceptance Testing
Splice and Span Loss Testing
Maintenance and Restoration
Documentation

Station #4 – Connectorization
Terminate LC, ST and SC
Connectors
Inspect Fiber Endfaces
Troubleshoot Terminations
Test and Inspect TFOCA Connectors

Station #5 – Optical Loss Testing
Test Tx and Rx Power Levels
Link Loss Measurements
Troubleshooting using Test Sets,
Visual Fault Finders, Identifiers
Documentation

"This will be very beneficial to me in the future. It has definitely expanded my knowledge of fiber. I wish I would have taken it years ago." – Matt Duszka, ARCH COAL