

Hands-On

# Fiber Optics & Fiber Management Systems



## Course Description

As a transport medium, copper has significant bandwidth and distance limitations. Fortunately, an alternative exists mankind has yet to determine the bandwidth or distance limitations of fiber optic cable. In this exciting course, discover how recent developments in fiber optic technology and DWDM are changing the world of bandwidth forever. This course also provides an overview of SONET and optical transmission technologies, and equipment as well as the important consideration of management systems used to track and control these optical networks.

## Students Will Learn

- **Demonstrations and Hands-on Labs**
- **Instructor Demonstration 1 - Feature management system overview.**
- **Instructor Demonstration 2 - Example Reports and worksheets.**
- **Instructor Demonstration 3 - Network maps and displays.**
- **Hands-on Labs 1 - Feature Management System - hands-on demo.**
- **Hands-on Labs 2 - Interactive Web Demo Session.**
- **Featuring OSP InSight Fiber Management Systems**
- **And More...**

## Target Audience

This program is designed for managers, sales, and technical personnel requiring basic knowledge in Fiber and Optical Network Technologies and the Management of these optical networks.

## Prerequisites

None

## Course Outline

## Module I: Overview of Physical Transport Technologies

### a. Problems with traditional copper transport media

- i. Scalability
- ii. Reliability
- iii. Susceptibility to Environmental Factors

### b. Advantages of Fiber Optic transport media

- i. In Local Area Networks
- ii. In Wide Area Networks

### c. Standardization of Fiber Optic technologies

- i. SONET

## Module II: Fiber Media

### a. Optical Transmission Overview

- i. Methods for Transmission
- ii. Attenuation
- iii. Modal Dispersion
- iv. Chromatic Dispersion

### b. Fiber Types and Connectors

- i. Single-Mode
- ii. Multi-Mode
- iii. Connectors

### c. Considerations in working with Fiber

- i. Splicing/Repairs
- ii. Susceptibility to Environmental Factors
- iii. Personnel training costs

## Module III: SONET

### a. SONET Overview

- i. SONET Description and Purpose
- ii. SONET Standards

iii. SONET Equipment

b. Drivers for SONET

i. User demands

1. High bandwidth

2. Multiple services

ii. Carrier needs

1. Standardization/Mid-span meet

c. Synchronous Digital Hierarchy

i. Signaling Levels

ii. Multiplexing Methods

Module IV: DWDM (Dense Wavelength Division Multiplexing

a. Techniques

b. Equipment

Module V: Current and Future Applications of Fiber Media

a. FTTH (Fiber-to-the-home)

b. FTTC (Fiber-to-the-curb)

i. Hybrid Fiber-Coax Networks

c. Emerging Fiber Technologies

Module VI: Managing Fiber Systems "The need for a Centralized Management System for Fiber "

a. Defining common management tasks

b. Setting up a Central Repository for Network information

c. Day to day tasks: Maintenance, Operations, and Reporting

d. Fault Location

e. Bandwidth Inventory Control

f. Engineering new Services

#### Module VII: Defining What Needs To Be Documented

a. Cable plant information

b. Access point information (manholes, handholes, aerial splices or slack coil)

c. Splice Enclosure Information

d. Building Information

e. Fiber Distribution Panels

f. Installed Equipment

g. Duct Information

h. Pole Information

i. Customer and contact Information

j. Documentation

#### Module VIII: Collecting Input Data

a. Existing Systems: Determining what data is available

b. Verifying available data:

i. Developing conventions for data entry and presentation

ii. Engineering review of existing data

iii. Data Input and Verification Reports

iv. Data entry considerations

v. Reviewing the Database

c. New build-outs: collecting the necessary information

Module IX: Some Standard Operating Procedures

- a. Documentation and Training standards
- b. Managing Files
- c. Back-up and Restore Procedures
- d. Adds, Moves and Changes
- e. Worksheets and Reports
- f. Implementing System Upgrades

Module X: Fiber Management Systems - Facts, Features and Fables

- a. Fiber Management Systems - Some Facts
- b. Fiber Management Systems - Common Features
- c. Fiber Management Systems - Fables and Misconceptions

Module XI: Considerations for Selecting a Fiber Management System

- a. Information Objects
- b. Documentation, reports and worksheets
- c. User Interface Considerations

Module XII: Managing the Data Entry Process

- a. To "Outsource" or not to "outsource"?
- b. Allocating internal resources for data entry, conversion and maintenance
- c. Choosing an "outsource" vendor - some considerations

## **Delivery Method**

Instructor led with Demonstrations and Hands-On Labs to reinforces materials covered.

## **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