

# Understanding Fiber & Optical Networks



## 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, as well as the equipment found in optical networks.

## Target Audience

Contractors, union craftsman, electricians, technicians, installers, splicers, LAN managers/administrators, end-users, engineers, MIS managers, facilities managers, architects and developers, systems engineers, telecom managers and anyone involved in repairing, installing, maintaining, designing, evaluating, or provisioning Cable, Fiber Optic Cables and Optical Networks.

## Prerequisites

A basic understanding of telecommunications. This information can be obtained in our courses below  
TeleCom Networks Today II

## Course Outline

### **Module I. Overview of Physical Transport Technologies**

- Problems with traditional copper transport media
  - i. Scalability
  - ii. Reliability
  - iii. Susceptibility to Environmental Factors
- Advantages of Fiber Optic transport media

- i. In Local Area Networks
  - ii. In Wide Area Networks
- Standardization of Fiber Optic technologies
  - i. SONET

## **Module II. Fiber Media**

- Optical Transmission Overview
  - i. Methods for Transmission
  - ii. Attenuation
  - iii. Modal Dispersion
  - iv. Chromatic Dispersion
- Fiber Types and Connectors
  - i. Single-Mode
  - ii. Multi-Mode
  - iii. Connectors
- Considerations in working with Fiber
  - i. Splicing/Repairs
  - ii. Susceptibility to Environmental Factors
  - iii. Personnel training costs

## **Module III. SONET**

- SONET Overview
  - i. SONET Description and Purpose
  - ii. SONET Standards
  - iii. SONET Equipment
- Drivers for SONET

- i. User demands
      - 1. High bandwidth
      - 2. Multiple services
    - ii. Carrier needs
      - 1. Standardization/Mid-span meet
  - Synchronous Digital Hierarchy
    - i. Signaling Levels
    - ii. Multiplexing Methods

#### **Module IV. DWDM (Dense Wavelength Division Multiplexing)**

- Techniques
  - k. Equipment

#### **Module V. Current and Future Applications of Fiber Media**

- l. FTTH (Fiber-to-the-home)
- m. FTTC (Fiber-to-the-curb)
  - i. Hybrid Fiber-Coax Networks
- N. FTTD (Fiber-to-the-Desk)
- O. Ethernet Over Fiber

Emerging Fiber Technologies

### **Delivery Method**

Instructor-Led with numerous case-studies 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

1 Day