

Hands-On

# OSP Design, Engineering and Planning (Copper/Fiber)



## Course Description

This extensive course was designed for those new to local loop design, planning and engineering - whether in telecommunications, CATV engineers designing fiber or copper, traffic engineering, municipal engineering, public utilities or any other roles that require familiarity with standards and common practices in outside plant design for fiber and copper.

This course begins with the basic concepts such as basic electricity, basic telephony, outside plant components and loop transmission. It steadily builds to more advanced concepts and skills, including feeder and distribution designs, digital loop carrier systems and fiber optics. Local loop facilities sometime referred to as "the last mile" are a critical and capital-intensive network component in delivering reliable and adequate telecommunications services to a local carrier's customers. The third day and the final day consist of copper and fiber design exercises that put to work the theories and practical parts of the course. Students will receive 4 fiber design cost models that they can use to examine fiber design alternatives. They will also have a chance to show the area they want to design in class so a design can be started for it.



In today's competitive markets, local loop facilities that are cost-effective, reliable and capable of accommodating changing customer needs are key to your organization's success.

## Students Will Learn

- **The basic design information often called engineering 101 including aerial, buried and underground considerations.**
- **Understand the basics of copper design including gauge, loading, bridged tap and other copper related topics.**
- **Understand the fiber optic design alternatives and how they compare economically**
- **Understand the impact of take rate, density and labor rate on fiber design options.**
- **Understand Fundamental facility planning- where things go in the field economically including COs, nodes, cabinets drop closures, feeder routes, and optical splitters and more.**
- **Practical applications for implementing the theories discussed.**

## Target Audience

This course is designed for telephony engineers/planners, CATV engineers designing fiber, traffic engineers, municipal planning engineers, utility engineers, technicians and technical managers with little or no previous experience in planning or engineering telecommunications local loop facilities containing copper and fiber. It is ideal for those new to the telecommunications industry. While fundamentals will be addressed, some previous familiarity with general telecommunications terms and concepts, although not necessary to benefit, will be an advantage that will maximize your learning experience. This course is technical in nature, but it offers detailed material and practical concepts without complex mathematics.

## Prerequisites

None.

## Course Outline

Basic electricity

AC, DC voltage, current and power

Series and parallel circuits

Resistance, capacitance, inductance

Basic Telephony

History

Local loop

Demark and NID

Voice telephony

Analog/digital

Outside Plant-

Outside plant- general

Components

Fiber optics

Special circuits

Outside Plant Systems

General design

Network design

Support structures- aerial, buried, underground

Feeder design

Cable information

Transmission

Electrical Protection- bonding/grounding

Cable Placing

Aerial design

A C Power influences

Clearances

Outside Plant Design

Distribution

Cable counts

Fundamental Planning- Field design

CO and Node placement

Cabinet placement

Feeder/Distribution cable placement in field

Residential subdivision design

Drop design

Copper Design exercises

Various densities are designed using copper cables by students

### **OSP Fiber Design**

-General engineering information

-FTTH Design options

-FTTH Design options comparison

-Take rate impact on design

-Density impact on design

-Other Design consideration

-FTTH Design steps

-FTTH Design exercises

-Various densities are designed using fiber cables by students

### **Notes**

Attendees do not need to bring anything. Attendees will receive four cost models to be used to analyze fiber optic design decisions. Attendees will also have a chance to show the area they want to design in order to get some insight in developing a design for it.

## **Delivery Method**

Instructor-Led using real-world design exercises and design solutions.

## **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**

5 Days