



Consulting and Training | Reach New Heights

Course Name

Fiber Optic Networks Design

Sector Name

Instrumentation & Controls

Document Type

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Fiber Optic Networks Design

Course Introduction

This course covers step by step the fiber optic networks design and architectures, teaches the trainees how to design the networks with standards compliance, choose the correct components, manage the installation, set up a test plan, and study deeply the applications of fiber optic in many applications using the latest technologies.

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Target Audience

- ✓ Designers
- ✓ Network
- ✓ Telecom engineers
- ✓ Presales
- ✓ Project managers
- ✓ Contractors
- ✓ Consultants

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Learning Objectives

- ✓ Knowledge of fiber optic fundamentals
- ✓ Knowledge of network topologies and how to choose the optimal one for any application
- ✓ Understanding the International standards TIA & ISO
- ✓ Study the fiber optic specifications
- ✓ Study deeply the specifications of the fiber optic cables
- ✓ Choose the proper and cost-effective components
- ✓ Choosing the active components
- ✓ Preparing Fiber Optic Plant Documentations
- ✓ Preparing Plant Link Loss Budget Analysis and Calculation
- ✓ Determine the bandwidth and bit rate
- ✓ Study the most advanced installation techniques
- ✓ Study the huge traffic transmission systems
- ✓ Study true examples and case studies in many sectors
- ✓ Study the fiber to the home design and applications

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Course Outline

✓ **01 Day One**

Fiber Optic Fundamentals

- ✓ Overview
- ✓ Advantages of Fiber Optics
- ✓ Fiber Optic vs. Copper
- ✓ Parameters explaining
- ✓ Fiber Optic Transmission Basics

Fiber Optic Types & Standards

- ✓ Single Mode
- ✓ Multi-Mode
- ✓ Plastic Fiber Optic

Fiber Optic Losses and Transmission Effects

- ✓ Insertion and Reflection Loss
- ✓ Splice Loss and Termination Loss
- ✓ dB & dBm
- ✓ Bending, Temperature, Humidity, and Pressure

Fiber Optic Design Overview

- ✓ Introduction to the fiber optic design
- ✓ Who can design the fiber optic networks?
- ✓ Design Process

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Course Outline

✓ **02 Day Two**

Fiber Optic Networks Topologies, Examples and Applications

- ✓ Meaning of Topology
- ✓ Star Topology
- ✓ Ring Topology
- ✓ Bus Topology
- ✓ Mesh Topology
- ✓ Tree Topology

Fiber Optic International Standard

- ✓ TIA
- ✓ ISO

Fiber Optic Cable Specifications: Studying

- ✓ Environmental Specifications
- ✓ Mechanical Specifications
- ✓ Optical Specifications

How to Choose the Components?

- ✓ Choosing Fiber Types

- ✓ Indoor cables (riser & Plenum)
- ✓ Outdoor cable (Armored & Heavy Duty)
- ✓ Hardware and Accessories
- ✓ Choosing Installation Techniques
- ✓ Choosing Civil Materials, Manholes, and Conduits
- ✓ NEC and IEC standards

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Course Outline

✓ **03 Day Three**

Advanced Fiber Optic Cable Installation Techniques

- ✓ Cable blowing (air jetting)
- ✓ Cable Floating
- ✓ Modern Submarine Cabling
- ✓ HDD
- ✓ Micro Trenching
- ✓ Micro Ducting
- ✓ Mid-Span

Plant Link Loss Budget Analysis and Calculation

- ✓ Loss Types
- ✓ Total Loss Equation
- ✓ Loss Safe Factor

Transmission Equipment Power Budget Calculation

- ✓ Transmitter Power
- ✓ Receiver Sensitivity
- ✓ Power Budget Calculation

Fiber Optic Active Components

- ✓ Fiber / Ethernet converters
- ✓ Fiber / Coaxial converters
- ✓ Fiber / serial converters
- ✓ SM / MM converters
- ✓ Industrial Switches
- ✓ Cisco SFP selection guide

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Course Outline

✓ **04 Day Four**

MM Fiber Bite Rate Calculation

- ✓ MM OM1, OM2, OM3 and OM4 Bandwidth
- ✓ MM Fiber and Bite Rate Calculation

Introduction to Optical Multiplexing

- ✓ Introduction to multiplexing
- ✓ FDM and TDM
- ✓ WDM
- ✓ CWDM
- ✓ DWDM
- ✓ OADM

Fiber Optic Project

- ✓ Site Survey
- ✓ Right of the Way
- ✓ Project Costing
- ✓ Network Planning
- ✓ Network Installation
- ✓ Dark Fiber

Fiber Optic Plant Documentations

- ✓ Network Drawing
- ✓ Preparing Bill of Quantities
- ✓ Installation Time Schedule
- ✓ Testing Sheets format
- ✓ Labeling
- ✓ As-built and Plant Handover

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✓ 05 Day Five

General Fiber Optic Applications and Studying Cases

- ✓ Power Application- SCADA system
- ✓ Oil Application - Oil pipeline
- ✓ Telecom Application - DWDM
- ✓ Military Application - Radar
- ✓ IT Application - 10G WAN
- ✓ Security Application - CCTV
- ✓ Media Application - SAN

FTTX (Fiber To The X)

- ✓ What is the FTTX?
- ✓ FTTX vs. Traditional Systems
- ✓ FTTO, FTTB, FTTN & FTTH
- ✓ Fiber Splitters
- ✓ Splitter Loss
- ✓ FTTH Design Guide

Network Management

- ✓ Project management
- ✓ Operation support

- ✓ Network Analytics
- ✓ Managing troubleshooting

Review and Quiz

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Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
Sept. 21, 2026	Sept. 25, 2026	5 days	4250.00 \$	UAE , Abu Dhabi
April 5, 2027	April 9, 2027	5 days	4250.00 \$	UAE , Dubai
May 17, 2026	May 21, 2026	5 days	4250.00 \$	KSA , Riyadh
Nov. 9, 2026	Nov. 13, 2026	5 days	5950.00 \$	USA , Los Angeles

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