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Course Name

advanced fiber optic power systems & Design in Power System Applications

Sector Name
Electrical Engineering

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Course Introduction

The Advanced Fiber Optic Power Systems course provides engineers and technical professionals with the knowledge and practical skills needed to design, install, and maintain high-performance fiber optic networks within modern power systems. As power grids rely increasingly on fast, reliable communication for monitoring, control, and automation, expertise in advanced fiber optic power systems has become essential.

Participants will learn about network planning, optical fiber installation techniques, testing and troubleshooting, and integration with power system applications. The course also covers best practices to ensure secure, efficient, and reliable data transmission for substations, smart grids, and energy infrastructure projects.

By completing this course, learners will be able to implement robust advanced fiber optic power systems, optimize network performance, reduce system downtime, and support advanced automation and control in power system environments

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Target Audience

✓ Power Systems Engineer

✓ Project Engineer

✓ Test Engineer

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Learning Objectives

- ✓ Knowledge of Network Topologies
- ✓ Understanding the International Standards TIA & ISO
- ✓ Understanding the Fiber Optic Specifications
- ✓ Choose the proper and cost-effective components
- ✓ Preparing Fiber Optic Plant Documentation in Power Project
- ✓ Preparing Plant Link Loss Budget Analysis and Calculation
- ✓ Studying True Examples of Power Applications
- ✓ Determine Effective Bandwidth & Bit Rate of Multimode Fiber
- ✓ Preparing the Fiber Cable End and Terminating the Fiber Optic Cables
- ✓ Also, Splice the Fiber Optic Cables

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Course Outline

✓ DAY 01

Module (01) Optical Physics

- ✓ Reflection
- ✓ Refraction
- ✓ Interference
- ✓ Attenuation
- ✓ Dispersion
- ✓ Refractive Index
- ✓ Numerical Aperture
- ✓ Cone of Acceptance
- ✓ Special Width

Module (02) Link Characteristics

- ✓ Premises
- ✓ Metro
- ✓ Long Haul

Module (03) SM Fiber Optic Standards

- ✓ TIA
- ✓ ISO

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Course Outline

✓ Day 02

Module (04) Loss Types and Loss Budget Calculation

- ✓ Fiber Insertion Loss
- ✓ Fiber Reflection Loss
- ✓ Splice Loss
- ✓ Termination Loss

Module (05) Power Budget Calculation

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

Module (06) MM Fiber Bite Rate Calculation

- ✓ OM1
- ✓ OM2
- ✓ OM3
- ✓ OM4

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Course Outline

✓ Day 03

Module (07) Fiber Optic Cable Types & Applications

- ✓ Indoor Cables
- ✓ Underground Cables
- ✓ Aerial Cables
- ✓ Sub-Marine Cables

Module (08) Fiber Optic Cable Types & Specifications

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

Module (09) Optical Transceiver used in Power System

- ✓ Media Converter
- ✓ SFP
- ✓ Built-in Optical Port

Module (10) Optics

- ✓ Lasers & LED

- ✓ Optical Detectors
- ✓ Optical Amplifier
- ✓ Optical Switches

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Course Outline

✓ Day 04

Module (11) Fiber Optic Project

- ✓ Site Survey
- ✓ Network Design
- ✓ Installation
- ✓ As Built

Module (12) Fiber Optic Design

- ✓ Basic Layout for the Network
- ✓ Documentations
- ✓ Planning the Networks
- ✓ Choose the Components
- ✓ Preparing the Bill of Quantities (BOQ)
- ✓ Design Review
- ✓ Cost Calculation
- ✓ Define Testing Requirements
- ✓ Writing Specifications for the Cable Plant
- ✓ The Right of Way

Module (13) Fiber Optic Installation

- ✓ Cable Pulling
- ✓ Direct Buried
- ✓ Cable Air Blowing

Module (14) Fiber Optic Splicing & Termination

- ✓ Fiber Optic Mechanical Termination
- ✓ Fiber Fusion Splicing

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Course Outline

✓ Day 05

Module (15) Fiber Optic Testing

- ✓ Loss Testing
- ✓ VFL
- ✓ OTDR
- ✓ Identifier
- ✓ Inspection Microscope
- ✓ Guideline of Testing & Troubleshooting

Module (16) Fiber Optic in Advanced Power Applications

- ✓ Power Control
- ✓ SCADA System
- ✓ Overhead Lines
- ✓ Underground Power System
- ✓ Submarine Power System
- ✓ Protective Relaying Systems
- ✓ ARC Protection Relay
- ✓ Transformer Heat Monitoring
- ✓ Power Cables Real-Time Thermal Monitoring
- ✓ Distributed Temperature Sensing

Module (17) Fiber Optics in Other Applications

- ✓ Oil & Gas
- ✓ Telecommunication
- ✓ IT
- ✓ Industry
- ✓ FTTX

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Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
March 15, 2027	March 19, 2027	5 days	4950.00 $	Spain , Barcelona
June 8, 2026	June 12, 2026	5 days	4250.00 $	UAE , Abu Dhabi
Sept. 21, 2026	Sept. 25, 2026	5 days	4250.00 $	UAE , Dubai
Jan. 4, 2027	Jan. 8, 2027	5 days	4250.00 $	UAE , Dubai

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