

## Passive Optical Networks – 2,5 days

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### CONTENTS

This course covers optical communication and networking technologies in the access network segment, focusing on passive optical networks (PONs).

To provide the general context the course reviews the evolution of fixed access networks from the first deployment of PONs to the recent standardization of 25GS-PON and 50G-PON.

The PON system architectures, physical layer, such as burst mode transmission, and network layer are analyzed in detail.

The course focuses on the PON topology, PON architecture, types of PON networks, Time-Division Multiplexing PON (TDM-PON) technologies, PON components, such as optical fibers and cables, transceivers and splitters, as well as PON deployment considerations explaining the different considerations that must be taken into account when planning, design, maintain and troubleshoot a PON.

### PREREQUISITES

Technical knowledge of the basic concepts of fiber optics and optical communication systems.

NOTE: This course is not delivered with the FoldOut methodology

### Evolution of Fixed Access Networks

- The application/service layer perspective
- The network layer perspective
- Access networks architectures
- The physical layer perspective
- Optical Access Networks Architectures comparison

### Optical Subsystems for Transmission

- Optical Fiber, Connectors, and Splicing
- Optical Sources
- Optical Receivers

### PON Physical Media Dependent (PMD) layer

- Key Concepts
- G-PON, XG-PON, and XGS-PON PMD
- Migration from G-PON to XG(S)-PON, and MultiPON-Modules
- NG-PON2

### FTTH project

- Ducts, Microducts, and Chambers
- Fiber Optic Cables for FTTH
- Connecting Homes
- Connecting Multi-Dwelling Units
- Fiber Management
- Geographic Information System

### Access Control Technologies in TDM-PON

- G-PON and E-PON MAC

- Key G-PON Technologies
- XG(S)-PON & NG-PON2 MAC

### **PON Maintenance and Troubleshooting**

- PON troubleshooting, Optical Power, and Alarms
- OTDR
- Connector Cleanliness & Fiber Inspection, and Measuring optical power
- Troubleshooting PON networks

### **Future PON**

- 25GS-PON & 50G-PON