

Certificate in FTTx Technology, Network Planning & Design Using ARCGIS & QGIS

The objective of the training on FTTX technology, network planning, and design using QGIS is to equip participants with the necessary knowledge and skills to effectively design and plan fiber optic networks using geospatial analysis tools.

Module 1- Introduction to FTTx basics

- Fiber optic transmission
- Basic fiber optic terminology
- Lightwave transmission
- Wavelength allocation chart
- FTTH formats
- PON generations

Module 2- Optical Fiber

- Fiber specifications
- Single-mode fiber characteristics ITU-T G.652
- ITU-T G.652D single-mode optical fiber
- ITU-T G.657 single-mode optical fiber
- Module 3 –Optical Cables
- Cable designs
- Optical cable for FTTx
- FTTx distribution and drop cables
- High fiber count cables
- Aerial fiber optic cables
- Distribution cables
- Cable structure and fiber counts
- Color Codes
- Cable handling
- Outside plant cable management
- Fiber distribution hubs

Module 4 – Connectors and Splitters

- Common FTTx connectors
- Small form factor LC connectors
- Multifiber connectors
- Fiber optic connector polishes
- Termination options
- Splitter flexibility and management
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Module 5 –

- AE versus PON
- FTTH design options
- AE versus PON cost comparisons

- The fundamental fiber plan

Module 6 – Fundamental Fiber Planning

- Fundamental planning design steps
- Cost considerations
- Fiber and cable management
- The ideal network location
- Central office location strategy
- Ideal hub/node placement
- Density and central office location
- PON system design
- Configuring fiber routes
- Ideal feeder route configuration
- Typical outside plant fundamental planning

Module 7 – Futureproofing & Module

- Fiber cable sizing
- What speed do we need to the home?
- FTTx needs stable reliable performance

Module 8 – PON Design Options

- Distributed split designs
- Determining the best solution
- OLT and splitter relationship
- OLT costs
- FTTx design efficiency
- Operational issues

Module 9 - Fiber to the Building

- MDUs and MTUs
- Get cabling to each user
- Fiber in the building design goals
- High-rise buildings
- Medium-rise buildings
- MDU existing infrastructure
- Telecommunications room and centers
- MDU cabling systems
- MDU buildings OSP design options
- Low rise and campus MDUs
- Typical cabinet design strategy
- Typical distributed split design strategy
- Distributed split design conclusions
- FTTB premises

- ONT options
- Optical network terminals and access points

Module 10 - Single-family Residential Areas

- PON areas
- Subdivision design strategies
- Typical drop layout
- Fiber drop design

Module 11 - Connectorization Options

- Connectorized versus fusion splicing
- Connectorized drops
- Common reasons for using connectors
- Conventional design options
- Plug and play design options
- Field terminated FTTH connectors
- Mechanical connectors
- Administration Network performance
- Organizational considerations
- Developing a cost model
- Advantages and disadvantages

Module 12 - Rural Areas Network design for rural areas

- Ideal hub/node placement
- Rural area network design
- Splitter placement in rural areas
- Conceptual example of reusing dead fibers

Module 13 - WDM-PON ODN and OSP issues

- The impact of WDM-PON
- NG-PON & G-PON2
- TWDM-PON
- Point-to-point WDM
- Wavelength allocations
- Multiplexing and demultiplexing
- WDM-PON design basics
- Home run design conversion
- Centralized design conversion
- Distributed split design conversion
- PON to WDM-PON conversion

Module 14 - Design Steps

- PON loss budgets
- Calculating network loss
- Optical loss budget example “Not to exceed” loss budgets
- General design steps
- Home run design steps
- Cabinet design steps
- Cabinet size plans
- Cost modelling
- Options for splitter placement
- Central office versus cabinet

Module 15 - Specifications Product specification

- Partial fiber specification
- Typical optical cable specification sheet ITU-T G.671
- Splitter specifications
- WDM specifications
- Physical layer standards
- Outside plant standards
- North American Codes
- Proper aerial route planning and engineering
- Typical pole clearances
- Fiber quality

Module 16 - FTTx Planning Network Design & Planning

- Network Capacity Planning
- Why is Network Capacity Planning important?
- Network Management by different tools
- Using Bandwidth Trends for Proactive Capacity Planning
- Bandwidth trends dashboard

Module 19 - Project management & planning

- Set standards for project planning
- Standardized PM policies and procedures
- Support the project managers in their ongoing work
- Provide training & support

Module 20 - FTTx Practical Demonstration Video and discussion

- OLTS or OSPM test methods
- OTDR Test methods
- Discussion of real-life case studies for the general problems faced in field
- Assignment for design with complete splicing plan and labelling

Module 21 - FTTx Network Design Using QGIS

- Foundation Of QGIS
- Network Topology Design
- Managing & Designing
- Connectivity and Associations
- Network Design
- Creating a sample network

➤ REQUIREMENTS:

- **Personal computer**
- **Safety Ware**
- **Smartphone**

MODULE COST: 400000UGx(105USD)