

Certificate Course in Advanced Telecom Transmission Technologies (FTTH & GPON)

Course Objective

This course provides the participants with a comprehensive Knowledge on Planning, Designing, Implementing, Managing and Trouble Shooting FTTH & GPON.

Course Outcomes

On completion of this course the participants will be able to:

- Excel on Network essentials and Optical fundamentals
- Expertise on telecom transmission technologies such as SONET/SDH, DWDM & GPON/FTTx
- Build GPON Infrastructure Networks

Target Audience

Students who are pursuing Under Graduate & Post Graduate courses on Electronics or Telecommunication or Information & Communication Engineering from Engineering Colleges of various Universities may attend this program

Teaching Methodology

This course is based on both theoretical lessons and practical exercises

Prerequisites

Graduates / Engineers / Diploma Holders in Electronics / Electrical / Communications / Telecom or Equivalent with general Knowledge of wireless telecommunication is desirable

Duration : 08 Weeks (5 days a week , 6 - 8 hours per day)

Batch 1 - 11-09-2017 to 04-11-2017

Course Outline

■ Network Essentials

- Network Architecture, Internetworking Devices, OSI, TCP/IP Model
- Network Addressing Design : IPv4/IPv6, Ethernet Technologies, MPLS Fundamentals

■ Optical Fundamentals

- Light theory, Introduction to fiber optics, Electromagnetic Spectrum
- Evolution of fiber, types of fiber, ITU-T Standards, Fusion & Mechanical Splicing, OTDR, Power meter
- Light sources & detectors, connectors like FC, SC, ST, LC, MU, Patch chords, Patch panel etc

■ SONET/SDH, DWDM

- Multiplexing techniques TDM & FDM, SDH architectures, STM-1, STM-4, STM-16, STM -64.
- SDH multiplexing & protection schemes, SONET layered Structure STS-N frame structures
- SDH tester, E1 tester, Elements of WDM link, OADMs and ROADMs, regenerators and transponders, Types of amplifiers, EDFA, pre-Inline & booster
- DWDM network design considerations, operating wave lengths, DWDM test & measurement, optical spectrum analyzer etc. Photonic networks
- Optical layer, optical routing and elements of all-optical networking , ROADM - Reconfigurable Optical Add-Drop Multiplexing
- Coherent optical communications, New optical modulation schemes for 40 G, 100Gb/s transmission, DP-QPSK
- Use of Digital Signal Processing along with coherent optical systems to alleviate chromatic dispersion, polarization mode dispersion and OSNR impairments

■ Overview of FTTX

- FTTx Technology, Architecture, Access Networks, Network Layers, Open Access networks

■ Passive Optical Networks

- PON Principles, Benefits and PON types (BPON / EPON / GPON)
- How Passive Optical Network is Economical, xPON comparison, GPON vs GEAPON

■ Building GPON Infrastructure Networks

- G-PON basics, Network Elements, OLT, ONU, Splitter, ODF, Power Budget Calculation
- GPON Standards, Infrastructure in-buildings, In-Building wiring, Transmission Basics GPON Multiplexing Architecture
- Downstream & Upstream TDM Architectures, GPON Stack & Control User Planes, Services: IPTV, VoIP and Internet, RF Services
- GTC Layer Main Functions, GTC Frame Format: Downstream, Upstream, ONU state machine, ONU status change: Activate, Deactivate, Disable, ONU, POPUP, PON Physical Parameters

■ **Case study:** Case Study of UTL GOA Network will be given to participants

■ **Industry training:** All the participants are taken to GOA BroadBand Network (GBBN) implemented by UTL and also visit to UTL R & D Manufacturing facilities where the optical fiber equipment's are designed and manufactured.