

## COURSE DESCRIPTION

6878

### Fiber in the Access Networks

27 September 2010 - 01 October 2010, Mauritius

5 Day(s)

Offering Partner: Eagle Photonics (India)

#### OVERVIEW

**FTTx (where x stands for H-Home, B-Building, C- Curb) is becoming very popular for triple play service where Voice, Data and Video all can go on a single fiber. Due to enormous bandwidth capacity of optical fiber, it has become medium of choice in long distance network replacing copper. Fiber to the access network is natural extension of technology where due to day by day increasing requirement of bandwidth, its only choice. This course covers fundamental and applications of FTTx technology.**

#### OBJECTIVES

- To learn fundamentals of fiber optics technology and its application in access networks
- Understanding about Planning and implementation of OAN
- Offering of Convergence services, Triple Play Services and VAS to customers using FTTX
- Understanding practical elements, their features, practical uses and demonstration

#### TARGET AUDIENCE

#### EXPECTED OUTCOME

This course is intended for the engineers, technicians and managers involved in the network planning, implementation, maintenance, customer service and technical discussion with clients for large bandwidth and triple play services with single connection requirement. After completing this course, participant will be able to describe and compare the benefits components and operation of the three main types of passive optical network as used in various configurations including fibre to the home (FTTH) and fibre to the cabinet (FTTC).

- Explain how the limitations of copper-based access networks prevent many customers from benefiting from enhanced tripleplay services
- Describe the basic structure of a passive optical network (PON), its cost and performance benefits and the role of its basics components
- Explain the techniques that allow customers to share the bandwidth offered by a single fibre
- Describe and compare the structures and benefits of various configuration of a PON including fibre to the home (FTTH), fibre to the node (FTTN) and fibre to the cabinet (FTTC)
- Describe the role of the various customer premises equipment (CPE) and distribution methods in a home for a triple play service (telephony, TV and internet access)

## COURSE OUTLINE

- Fundamentals of Fiber Optics
  - Fiber types
  - Principles
  - Advantage and applications
- Access network Technologies
  - Basics of PON
  - Advances in PON
  - Active optical Network (AON)
  - Advantages of PON Cost/Service
  - Comparison of AON & PON
- Fiber in the last Mile
  - FTT/FTTK
  - FTTB
  - FTTH
  - Fiber to the Last Mile V/s Fiber to the First Mile
- Standards & Protocols for Access Network
  - IEEE 803.3ah/ITU-T G.894.2
  - APON, BPON, EPON & GEAPON
  - Ethernet in First Mile
  - GPON
  - Comparison and Advantages of each System.
- Network Topologies
  - Tree, CWDM, Ring
  - Advantage and application of above topologies
- Carrier Class Redundancy
  - Tree Topology Protection
  - Ring Topology Protection
- Protection System Architecture
  - Protection Switching Control
  - Automatic Interface Selection
  - Alarms Reporting
  - Gigabit-Ethernet Protection
  - Passive Spanning Tree
- Link Budget, Reach & Split Ratio
  - Wavelength Plans
  - Optical Components Parameters
  - Link Budget: Down streams & Upstream, Associated Distances & Split Ratio
- PON Services
  - VOIP & TDM based Voice Services
  - Data Services
  - VLANs & Video Services
- Various kinds of Fiber & Technology Used For FTTH
  - Bend insensitive Fiber G652D
  - G655 Standard for CWDM & DWDM Networks
  - Micro Cables & Blown Fiber
- Network Construction Practices / Methodology for Inside Premise Fiber Cabling
  - Laying of Cables inside the Building & Bends
  - Various Accessories for in building work
- Various Elements of Fiber Access Networks
  - OLT, ONU, ODN
  - Fiber Management System, termination box
  - Access cable - Fiber (Underground, Overhead, Drop)
  - Passive Elements - Splitters, patch cords, Connectors
  - Splicing and Connectorisation
  - Cat 5E and Cat 6, Cat 6A cables
  - RJ 45 and RJ11 connectors
  - RF connectivity for Cable TV
- Testing of Fiber Access Networks
  - Optical Testers like OTDR, Light source, Power meter, Attenuator, VFL
  - Copper tester like Cable Analyzer, Link tester

- Advances in OAN

## **EXPERT PROFILE**

### **Hitesh, Mehta**

Hitesh Mehta is co founder of Eagle Photonics, a company serving telecom industry, since 2002 and having over 15 years of professional experience in the field of Optical fiber communication and Photonics. He served at Optel Telecommunication Limited, Bhopal, India, a pioneering fiber optics company, for 6 years in the area of optical fiber cable and accessories production & later moved to R&D where he was responsible for the Laser diode packaging project supported by Ministry of IT, India. The research & innovation culminated in filing of two patents. Later he moved to TVS interconnect, Bangalore, India as Business Development Manager and established Nortel Networks' component division, Virtual Photonics' and Lightwave Micro's photonics business.

Hitesh visited leading international vendors to closely study technical and business aspects of Photonics products & its commercial opportunities in the Indian context. He co-founded Eagle Photonics in year 2002, which has created a niche for itself in the fiber optic services industry, especially in the Telecom sector. Eagle Photonics has established itself as unique training and consultancy organization in South Asia and has gained excellent reputation for fiber optic communication and transmission services. He provides consultancy to telecom companies in India, Bangladesh, Maldives and Middle-East countries and is associated with many professional societies including active IEEE volunteer in Bangalore section where he worked as Treasurer and Secretary for Bangalore section. He was the co-ordinator for its continuing education program for working professional (PROFICIENCE) at IISc, Bangalore, India. He is also a member of IETE, IEEE Communication society and Optical Society of America. He has delivered talks & addressed seminars in India & abroad on Fiber optics and Optical networking and has helped many collages with setting up of optical lab. He has received his Masters degree in Technology in applied optics from IIT-Delhi.

