

Certified Optical Network Engineer (CONE) Access Networks

On this Certified Optical Network Engineer training programme you'll learn how optical access networks can be engineered to deliver high speed connectivity to homes & businesses. You'll assess the technology options for delivering services over Passive Optical Networks.

You'll learn about the innovative ways that fibre optic cabling can be deployed in urban and rural environments to provide ubiquitous, yet cost-effective connectivity, and you'll understand how all the building blocks fit together to provide the infrastructure from central office to subscriber.

You'll learn the issues involved with planning and design of optical access network infrastructure and apply them in a realistic case study.



Objectives

At the end of this course you will be able to:

- explain the driving forces behind FTTx
- compare FTTx with alternative technologies
- describe the building blocks that make up the FTTx infrastructure
- identify suitable installation technologies
- compare the different types of PON in the standards
- appreciate the planning considerations for different situations
- discuss the key issues knowledgeably with suppliers, customers and colleagues
- design link configurations & verify their optical performance
- identify the key tasks involved with deploying FTTx
- ensure the quality of PON installations
- compare different FTTx solutions from around the world

Duration
5 days

Why does this course exist?

There are many different driving forces for FTTx, both in technology and socio-economic terms. Different territories, different cultures, different regulatory regimes, different population densities all require different solutions. This comprehensive training programme addresses all the issues to help you decide on your optimum solution and provides you with the tools to plan, design, build and test the infrastructure as well operate and maintain the network.

What does it cover?

An in-depth assessment of all the options for Optical Access Network infrastructure, combined with an appreciation of the systems that may operate over that infrastructure. All of this is presented from a vendor neutral perspective with a close eye on the relevant standards from ITU, IEEE, IEC and CENELEC. Case studies from around the world highlight how different solutions are suitable in different situations.

Key Benefits

- clear explanations, delivered in plain English will help you understand concepts that underpin modern optical networks
- come to terms with the key technologies free of any vendor bias, spin or marketing hype
- review all of the issues so that you get the full picture of optical networking
- use case studies and assignments to apply your learning to real world scenarios
- learn directly from Richard Ednay, UK Principal Expert on IEC fibre optic systems working group and ITU-T Study Group 15 on fibre optic systems
- gain Certified Optical Network Engineer status to demonstrate your knowledge and professionalism

Is this course for you?

This is an advanced level course, so you'll need some background in fibre optics and communications systems. The Certification is based on successful completion of an assignment and an examination during the course.

Tel +44(0)1756 797155

www.ott.co.uk

sales@ott.co.uk

Fax +44(0)1756 797112

providing answers in fibre optics and communications cabling

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Course Content

ACCESS NETWORKS THE DRIVING FORCES

- Voice: POTS to VoIP
- Video: broadcast to Video on Demand, IP-TV, interactive video, HD-TV
- Data: dial-up to broadband
- Mobile: all of the above everywhere
- How much bandwidth?
- Regulation, legislation, funding, distorting the economics
- What next?

FTTX

- Home
- Business
- Kerb (curb)
- MDU (block of flats, condominium)
- Node, remote DSLAMs

ALTERNATIVES TO OPTICAL ACCESS NETWORKS

- POTS over twisted pair
- Cable TV over coaxial
- Hybrid Fibre Coax (HFC)
- Broadband Wireless Access
- WiMax
- Free Space Optical (FSO)

COMPONENTS & HARDWARE

- Fibre types G.652, G.657, G.650.1
- Cables & blown fibre
- Splitters
- WDMs
- Exchange equipment & ODFs
- Street furniture, joint housings, splitter cabs etc.
- CPE

INSTALLATION TECHNOLOGIES

- Underground ducts
- Slot technologies
- Overhead drop cables
- Blown fibre & cable
- Gas pipes
- waste water pipes
- drinking water pipes
- electricity cables

PON TECHNOLOGIES

- APON
- BPON
- EPON & EFM
- GPON
- WDM-PON

PON TOPOLOGIES

- point to point
- point to multipoint
- super-PON
- extended reach PON

PLANNING CONSIDERATIONS

- Customer density MDU, Terraced, detached, dispersed
- Greenfield issues
- Rights of way
- Ownership issues

DESIGNING OPTICAL LINKS

- Optical power and loss budgets
- WDM issues
- Splitter losses
- Optical Amplifiers?

INSTALLATION ISSUES

- Ducting
- Aerial installations
- Cable installation/blowing
- Cable jointing
- Terminating fibres in customer premises
- Terminating fibres in Central offices

TESTING PONS

- power level measurements
- insertion loss measurement
- OTDR testing
- Active monitoring

OPERATIONAL & MAINTENANCE ISSUES

- adding customer connections
- troubleshooting
- upgrading to higher data rates

CASE STUDIES

- Verizon USA
- BT Ebbsfleet UK
- Japan
- Korea

DESIGN ASSIGNMENT

EXAMINATION

