

AccessNet

learn telecoms interactive e-learning suite of courses
from PTT covering access technologies.

There is an increasing demand from both business and residential customers for high-speed access to the Internet. Service providers are also introducing triple-play services including IP-based television (IPTV) that rely on high capacity broadband connections.

The courses in this suite discuss the methods of exploiting existing copper access networks to provide broadband connections. Optical fibre is being introduced in the access network which will provide a step change in the service to customers - this is also discussed.

The AccessNet suite consists of three courses:

- ADSL principles
 - DSL systems
 - Fibre in the access network
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Who will benefit from studying the AccessNet courses:

Those who are involved in the planning, installation or maintenance of telecommunications access networks.

Training delivery:

Study online over the Internet or company intranet.

Training facilities:

Each course in the AccessNet suite:

- provides typically over 6 hours of in-depth, authoritative technical training.
 - uses interactive simulations, hypertext links and question sessions to involve the trainee fully in the learning experience.
 - provides personalised training - each trainee can make his/her own notes and place bookmarks.
 - provides a structured assessed course and can also be used to browse for revision or reference.
 - provides a record of progress and level of achievement. At the end of a course, a trainee can obtain a personalised certificate of achievement.
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Related PTT e-learning courses:

Video over IP - provision of IP-based television services over broadband.
WiMAX radio networks - providing broadband access over wireless
Next Generation Networks – IP-based telecommunications systems

ADSL principles course

AccessNet

This course is intended for technical staff involved in the planning, provisioning, and maintenance of Digital Subscriber Line (DSL) broadband connections.

Pre-requisite:

A basic understanding of analogue and digital transmission.

It is suggested that the PTT e-learning course SRB: "Transmission fundamentals" is completed before attempting this course.

Course Aim:

To describe the characteristics and structure of access networks based on the use of copper wires and explain the principles of the technologies that provide access to broadband services over those wires.

Course objectives:

At the end of this course, the trainee will be able to:

Describe the structure and the role of the functional components of a conventional copper-based access network.

Describe the cause and effects of the various impairments on the last mile that limit the performance of DSL service.

Explain the principles, role and characteristics of the various modulation techniques used in DSL systems.

Explain the principles, role and characteristics of the various error correction systems used in DSL systems.

Explain the basic principles and operation of an ADSL system and describe the functions of its components.

Describe and compare the functions, characteristics and performance of various types of DSL system including ADSL2+ and VDSL2

Number of modules: 6

Approximate study time: 7 hours

DSL systems course

AccessNet This course is intended for technical staff involved in the planning, provisioning, and maintenance of Digital Subscriber Line (DSL) broadband connections.

Pre-requisite:

An understanding of the principles of ADSL.

We suggest that the PTT e-learning course DSL course A: “ADSL principles” is completed before attempting this course.

An understanding of the use and operation of Internet protocols would also be an advantage. We suggest that the PTT course TransNet F: “IP networks and the Internet” is completed before attempting this course.

Course Aim:

To describe the structure, functional components, operation and testing of systems that provide Digital Subscriber Line (DSL) services to customers.

Course objectives :

At the end of this course, the trainee will be able to:

Describe the role of the equipment (including DSLAM and B-RAS) and protocols used in the networks that provide DSL-based broadband Internet access.

Describe the operation of the protocols used in the provision of an ADSL connection to a customer including PPP over Ethernet (PPPoE) and PPP over ATM (PPPoA).

Describe the architectures and techniques used to provide DSL services over conventional (ATM-based) telecommunication networks.

Describe the architectures and techniques used to provide DSL services over next generation networks based on the use of the Internet Protocol (IP).

To describe the principles of operation and benefits of dynamic spectrum management (DSM) for DSL systems.

Describe the role of the equipment at an ADSL customer’s premises.

Describe the principles, operation, and facilities of symmetrical DSL (SHDSL) service provision.

Describe the tests that can be carried out on a DSL connection and explain their purpose.

Number of modules: 7

Approximate study time: 8 hours

Fibre in the access network course

AccessNet This course is intended for staff involved in the planning, provisioning, and maintenance of fibre-based access networks.

Pre-requisite:

Those studying the more technical aspects of this course would benefit from a basic understanding of optical fibre principles, packet switching and time division multiplexing. It is suggested, therefore, that the PTT e-learning courses SRB: “Transmission fundamentals” and SRC: “Data communication principles” are studied before attempting this course.

Course Aim:

After completing this course a trainee 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).

Course objectives:

At the end of this course, the trainee will be able to:

Explain how the limitations of copper-based access networks prevent many customers from benefiting from enhanced triple-play services.

Describe the basic structure of a passive optical network (PON), its cost and performance benefits and the role of its basic 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 configurations of a PON including fibre to the home (FTTH), fibre to the node (FTTN) and fibre to the cabinet (FTTC).

Describe and compare the service features of various types of passive optical network (PON), and the equipment employed in FTTC and FTTH configurations.

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).

Describe the protocols and techniques used to transport various types of traffic over Broadband PON (BPON) and Gigabit PON (GPON) systems.

Describe the benefits of a differentiated service and the techniques used for its provision in BPONs and GPONs.

Describe the implementation and role of dynamic bandwidth allocation in BPONs and GPONs.

Explain that the Ethernet PON (EPON) standards were developed to reduce the complexity of passive optical networks and reduce system costs.

Describe the protocols and techniques used to transport various types of traffic over an EPON.

Describe the role of the multipoint control protocol (MPCP) in an EPON.

Explain the limitations of the various methods used for a differentiated service in an EPON.

Describe the capabilities of the latest 10 Gbit/s generation of PON systems and explain how a faster bit rate system can co-exist with an older generation system on the same passive optical network.

Number of modules: 6

Approximate study time: 7 hours