

# Legacy

learntelecoms interactive e-learning Legacy courses from PTT

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## Legacy courses

These interactive, multimedia e-learning courses from PTT cover data services that are still used by some organisations but have largely been superseded by more modern technologies.

The e-learning courses are designed to run under Windows™ XP or Vista.

X25 data services  
Frame Relay data services  
ATM networks

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## Each course:

- provides several hours of in-depth, authoritative technical training
  - employs interactive simulations, hypertext links and question sessions to fully involve the trainee in the learning experience.
  - provides personalised training with each trainee able to make his/her own notes and place bookmarks. A record of progress and level of achievement is recorded for each trainee.
  - provides a structured assessed course and can also be used to browse for revision or reference.
  - provides revision links between each chapter and relevant screens in previous chapters.
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## Target audience:

These courses are suitable for technical staff involved in the operation or maintenance of legacy Wide Area Networks and data services.

# \_.Legacy

learntelecoms legacy e-learning courses  
Course B: X25 data services

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## Course aim:

This course provides an introduction to the principles, operation and features of data services conforming to the ITU X25 recommendations.

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## Pre-requisites:

Understanding of the basic principles of packet switching. It is recommended that TransNet course A – Principles of Wide Area Networks – is studied before attempting this course.

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## Course content:

**Introduction to X25:** Features and applications of an X25 data service; functions of the equipment required to access an X25 data service; introduction to the protocols involved in X25 data transfer; provision of virtual circuits; significance of Logical Channel Numbers (LCN).

**X25 error checking and flow control:** Introduction to the mechanisms used at both the X25 data link layer and the network layer to ensure the reliable, in-sequence delivery of packets; concept of window size; significance of Send Sequence Numbers (SSN) and Receive Sequence Numbers (RSN).

**X25 packets and frames:** Description of the function of the fields of a of data link layer LAPB frame and a network layer PLP packet; role of the different types of PLP control packet; demonstration of the use of control packets in setting up a switched virtual circuit.

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**Course aim:**

This course provides an introduction to the principles, operation and features of data services conforming to the Frame Relay specifications.

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**Pre-requisites:**

Understanding of the basic principles of packet switching. It is recommended that TransNet course A – Principles of Wide Area Networks – is studied before attempting this course.

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**Course content:**

**Introduction to Frame Relay:** Basic components of a Wide Area Network (WAN) employing Frame Relay access; introduction to the protocols involved in the provision of a Frame Relay network; significance of the virtual circuit parameters CIR and DLCI; facilities and benefits of a Frame Relay data service.

**Congestion control:** Causes and effects of congestion; significance of congestion collapse; function of the fields of the frame header; explicit and implicit congestion notification; congestion control measures including the function of the DE, FECN and BECN bits.

**Local Management Interface (LMI):** The facilities provided by the link management facilities of the LMI extensions to the Frame Relay specification; implementation of global addressing with LMI; use of the Inverse Address Resolution Protocol (InARP) in conjunction with global addressing; LMI multicasting; function of the fields in an LMI frame.

**Voice over Frame Relay:** Introduction to the techniques used to overcome the limitations of a Frame Relay connection to provide a telephony service over a Frame Relay virtual circuit; the use and benefits of frame fragmentation, voice compression and silence suppression; use of sub-frames to transport

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**Course aim:**

This course describes the structure, operation and features of data networks employing the Asynchronous Transfer Mode (ATM). It is recommended that the “Principles of ATM” course in the TransNet suite is studied before attempting this course.

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**Pre-requisites:**

Understanding of the basic principles of the Asynchronous Transfer Mode (ATM). It is recommended that TransNet course D – Principles of ATM – is studied before attempting this course.

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**Course content:**

**Virtual networks and interworking:** Interconnecting LANS using ATM Permanent Virtual Connections (PVCs); interworking between Frame Relay and ATM; use of a Data Exchange Interface (DXI) to connect existing equipment such as routers to an ATM network.

**ATM networks:** Functional description of ATM switches and cross-connects; components of an end-user’s network and an ATM public network; comparison of B-ICI, DXI, FUNI, UNI, NNI and PNNI interfaces; ATM signalling inc. DSS2 and B-ISUP.

**ATM addressing schemes:** Hierarchical global addressing; the different ATM private and public address structures; choice of public network address scheme.

**Private Network Node Interface (PNNI):** Signalling, addressing and route discovery aspects of the PNNI; significance of peer groups; the role of a Peer Group Leader (PGL); the building of a topological database; the role of a Logical Group Node (LGN); description of source routing in a PNNI network; requesting a quality of service using PNNI signaling; operation of connection admission control; structure of a PNNI address.

**Voice over ATM:** Reducing the effects of cell fill delay; interworking with a circuit-switched network with particular reference to signalling and synchronisation issues; operation and features of unstructured and structured AAL 1 Circuit Emulation Services; benefits and operation of an AAL 2 VBR voice trunking.

**IP over ATM networks:** Comparison of IP and ATM networks; the use and limitations of “Classical IP over ATM”; benefits of the use of “cut through” ATM virtual channel connections compared with the use of IP routing; using the Next Hop Resolution Protocol (NHRP) to provide “cut through” connections;