

## TCE: Introduction to telecoms services

### Online course specification

#### Target audience:

This course is designed in particular for customer service agents and retail sales representatives working in the telecommunications sector.

This online course keeps technical detail to the absolute minimum necessary to gain an appreciation of telecoms services.

#### Course aim:

By the end of this course trainees will be able to describe the facilities and capabilities of modern telecommunications services including telephony, broadband, and mobile services.

#### Course level: Introductory

*An explanation of PTT course levels is given at the end of this document*

#### Pre-requisites:

This course does not assume any prior knowledge of telecommunications. A technology background is also not necessary to benefit from this course.

#### Course structure:

The course consists of the following 4 modules:

1. Digital communications
2. Telephone services
3. Fixed line broadband services
4. Mobile services

#### Module 1: Digital communications

Module aim: To introduce the benefits, capabilities and applications of digital communications, and explain the importance of telecommunications in everyone's lives.

After completing this module, a trainee will be able to:

- explain that telecoms services have rapidly evolved in the last 20 years to become indispensable to most people.
- explain that various types of media including speech, images and video can be combined and carried as a stream of binary ones and zeroes over a digital link.
- explain the significance of the speed at which information can be transferred over a communications link.
- explain that the term "bit rate" is a measure of the speed at which information can be transmitted over a communications link.
- explain the relationship between, and the significance of, the terms "bit rate" and "bandwidth".
- describe and compare the bandwidth and applications of the various types of fixed line and terrestrial wireless communications link.
- describe and compare the characteristics and applications of geostationary and low earth orbit satellite services.
- describe the need for regulation of telecoms services with reference to the roles of national regulators and the International Telecommunication Union (ITU).

## **Module 2: Telephone services**

Module aim: To introduce the facilities offered by a public telephone service to businesses and residential customers, and explain ways in which a telecoms service can be evaluated.

After completing this module, a trainee will be able to:

- describe the various measures of the quality of service provided by a public telephone network.
- give examples of the facilities offered by a modern public telephony service
- describe the structure and allocation of numbering for a public telephone service.
- describe the different types of non-geographic number in terms of the charges applied to them, the regulation of the use of such numbers and typical applications.
- describe the need for, and ways of providing, number portability.
- describe methods of reducing the frequency of unsolicited calls.

## **Module 3: Fixed line broadband services**

Module aim: To compare the different ways of providing customers with access to the Internet and other digital services.

After completing this module, a trainee will be able to:

- explain how a conventional telephone line can be used to access the Internet and digital TV services.
- compare the capabilities of the various Digital Subscriber Line (DSL) services including ADSL and VDSL.
- describe the various factors that affect the broadband speed offered by a DSL service.
- explain the benefits offered by optical fibre for residential and business customers requiring access to data services.
- compare the capabilities of fibre to the home, fibre to the cabinet and Cable TV broadband services.
- describe the role of the various devices in a home or small business premises necessary for access to broadband services.
- describe the capabilities and applications of fixed wireless access (FWA) and low earth orbit (LEO) broadband services.

## **Module 4: Mobile services**

Module aim: To introduce the operation and capabilities of the systems that provide mobile communications.

After completing this module, a trainee will be able to:

- explain that modern mobile systems offer telephony, messaging, data, and location-based services and give applications of each.
- explain the concept of mobile cells and the factors that affect the size and shape of a cell.
- describe the process of handover as a mobile moves from one cell to another.
- explain the concept of roaming as applied to mobile phone calls.
- explain that the achievable data transfer rates depend on several factors including the number of active mobile users in an area.
- compare the data transfer capabilities of the various generations of mobile system including GSM, 3G (UMTS), 4G (LTE) and 5G.
- describe the basic security measures taken to prevent the unauthorised use of mobile phone services.
- describe the benefits to mobile service providers of sharing some or all of the physical infrastructure necessary to provide mobile services.

**Course access requirements:**

To access the course, a computer/tablet running a browser such as Chrome, Safari, Edge etc is required. The device should have an active Internet connection and a screen resolution of at least 1024x768.

**Learning facilities:**

This online course employs interactive simulations, hypertext links to an online glossary and multiple-choice question sessions to fully involve the trainee in the learning experience. Each module provides revision links to previously studied, relevant topics. A record of progress and level of achievement is recorded for each trainee. Once studied as a structured, assessed course, the content can be browsed for revision or reference.

**PTT course levels:**

PTT online courses are categorised by one of three levels according to the depth of treatment they provide:

**1. Introductory:**

PTT Introductory courses are designed for those with no previous experience or knowledge of telecommunications. These courses provide an overview of telecommunications or discuss the fundamentals of electronic communications. The study of general science at secondary (high) school is a typical pre-requisite for PTT Introductory courses.

PTT Introductory courses are suitable for those joining the telecommunications or ICT sector particularly those in an apprenticeship programme.

**2. Intermediate:**

PTT Intermediate courses are designed for technicians and engineers requiring an understanding of a certain aspect of information communications technology (ICT). Those planning to study an Intermediate course should understand the basic principles of electronic communications.

The depth of treatment provided by Intermediate courses is typically equivalent to level 3 of a UK national vocational qualification (NVQ). PTT Intermediate courses can be used to support level 3 digital apprenticeships.

**3. Advanced:**

PTT Advanced courses are designed for those who require an in-depth treatment of a certain aspect of ICT or telecommunications. Such courses are suitable for system designers as well as those who will be responsible for the maintenance of the system described in the course.

Those planning to study a PTT Advanced course should have a background in telecommunications or ICT, and an understanding of ICT fundamentals and the basic principles of the type of telecommunications or ICT system described in the course.

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