www.ptt.co.uk

TCC: Telecommunications infrastructure and administration

Online course specification

Target audience:
This course is designed for managers who require an appreciation of those aspects of telecommunications provision that are unique to the sector. The course is especially suitable for those joining the telecoms industry.

Course aim:
To introduce the underlying physical infrastructure of a telecommunications system and the commercial, standardisation and regulatory aspects of telecoms provision.

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.

Course structure:
The course consists of the following 3 modules:

1. Telecoms infrastructure
2. Standards and regulation
3. Interconnection

Module 1: Telecoms infrastructure

Module aim: To describe the physical infrastructure that underlies the provision of telecommunications services.

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

- compare the capabilities and applications of the various transmission media including optical fibre and microwave links.
- describe the role of the components of microwave radio and optical fibre links.
- describe and compare the roles and structure of core, metro and access networks.
- describe the measures that are taken to maximise the resilience of a telecommunications system.
- describe the factors that determine the shape and coverage area of a cell in a radio access network (RAN).
- describe measures that can be taken to increase the traffic handling capacity of a radio access network.
- describe how all or part of the infrastructure of a mobile network can be shared by operators to reduce costs.
- describe the structure and role of the physical elements of a PSTN local access network.
- describe the relative advantages of fibre to the home and fibre to the cabinet connections.
- describe and compare the roles of wayleaves and easements when building the telecoms infrastructure.

Module 2: Standards and regulation

Module aim: To introduce the role of standards and regulations in the telecommunications sector and the national and international bodies which publish standards and regulations and control the provision of telecommunications services.

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

- describe the status of the ITU, its membership, and the basic role of each of its three sectors.
- describe the role of the Telecommunications Service Regulations and Radio Regulations as published by the ITU, and their status in terms of development and enforcement.
- explain the role and status of ITU Recommendations regarding technical standards and describe how they are produced.
- describe the status and role of the various European organisations that produce standards for telecommunications systems, explaining the relationship between them.
- describe how protocols for the Internet are developed and the status of RFCs.
- describe the status and role of the International Standards Organisation (ISO) and the European and national standards organisations which have relationships with the ISO.
- describe the role of national regulatory authorities with reference to competition and deregulation, universal service requirements and the conditions applied to incumbents and competitors.
- describe the health and safety issues that are of particular relevance to the telecommunications sector.

Module 3: Interconnection

Module aim: To describe the commercial and technical aspects of the interconnection of networks belonging to different operators with reference to interconnection agreements, settlement of accounts and unbundling.

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

- describe the need for operators to interconnect their networks giving examples of types of interconnection
- describe the purpose of an interconnection agreement giving examples of the topics covered by such an agreement.
- explain how operators share revenue for international calls with reference to the ITU accounting rate system.
- explain the disadvantages of the accounting rate system in a competitive environment.
- explain that both the ITU and the FCC have independently modified the accounting rate system in an attempt to reduce settlement charges.
- describe alternative accounting systems giving examples of their use.
- describe the role of transit services and peering arrangements with regard to providing connections to the Internet.
- explain the term “net neutrality” and describe how regulators view issues relating to traffic discrimination on the Internet.
- describe the role and facilities typically provided by clearing houses, roaming hubs and IP exchanges for mobile operators.
- describe the purpose and method of provision of local loop unbundling, sub loop unbundling, and virtual unbundling.

Course access requirements:
To access the course, a computer running a browser such as Google Chrome, Safari etc is required. The computer should have Internet access. A screen resolution of at least 1024x768 is necessary.

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 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 telecommunications. Those planning to study an Intermediate course should have an understanding of 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 the attainment of a Communications Technology NVQ at level 3.

3. **Advanced:**

   PTT Advanced courses are designed for those who require an in-depth treatment of a certain aspect of 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, and an understanding of telecommunications fundamentals and the principles of the type of telecommunications system described in the course.

PTT
February 2015