WCDMA/UMTS Air Interface

Who Should Attend?

This course is designed for radio network planning and design engineers, radio network tuning engineers, and access transport network design engineers. It is recommended for personnel who need an understanding of WCDMA/UMTS air interfaces.

Course Scope

1. Introduction: Network Architecture, UMTS R99/R3, UMTS R4, UMTS R5, UMTS R6, UMTS Domain Architecture, UTRAN, RNC, Node B, UE and USIM, Area Concept, Numbering and Identification.
2. WCDMA: Multiple Access, Duplex Division, 3G Radio Spectrum, WCDMA Overview, Main Principles, Advantages and Problems, Spreading Process, Channellisation, Scrambling, Filtering, and Modulation.
3. Channels: Radio Channels, Physical Channels, Transport Channels, Logical Channels, Channel Mapping, Channels and Protocol Layers.
4. Quality of Service: QoS Architecture, UMTS QoS Classes, Sources of Service Attributes, UMTS Bearer Service Attributes, RAB Service Attributes, Radio Bearer Service Attributes, RAN Access, and CN Bearer Service Attributes
5. Channel Coding: Source Coding, AMR, Channel Coding, Error Detection, Error Correction, Interleaving, Dataflow through Layer 1, TFCI and CCTrCH, Coding for 12.2 Speech, VBR, DTX, and BTFD.
6. Power Control: Open-loop Power Control, Inner-loop Power Control, Outer-Loop Power control, Power Control in Soft Handover.
7. Multipath Propagation: Short- and Long-time Delay Profile, Rake Receiver, Downlink Open-loop Transmit Diversity, Downlink Closed-loop Transmit Diversity.
8. Synchronisation and Random Access: Downlink Timing, Cell Search Procedure, and Random Access.
9. Idle Mode: PLMN Selection, Cell Selection and Reselection, System Information, Mobility Management, Paging, Cell Reselection between GERAN and UTRAN.
10. Handover: Cell Sets and Measurements, Soft/Softer Handover, Events, Signalling, Time Offset, Handover between GERAN and UTRAN, Hard Handover, and Compressed Mode.

Course Objectives

This course provides a detailed description of WCDMA FDD technology and its use in UMTS networks. The training focuses on the physical layer operation, procedures, and other functions closely related to the physical layer. The training presents functionality related to the use of R99 dedicated channels.

Prerequisites

The participants should have basic knowledge of WCDMA/UMTS.

Training Structure

Three-day training divided into logical sessions.

Methodology

Instructor-led training and theoretical exercises.