



## UMTS Technical Overview

Course Duration: 3 days

### Training Course Description:

This course describes the basic technical functionality, facilities & components in a 3G wireless system. Topics covered include, 3G specifications, conceptual models, system architecture, UTRAN and UMTS Core Network, security, and protocols & basic procedures. The course can be delivered from a handset or core network perspective.

### Prerequisites:

The target audiences for this course are students wishing to gain a technical knowledge of UMTS technology, covering all aspects of the UMTS network. A good understanding of wireless communications would be advantageous, as would telecommunication experience

**UMTS Technical Overview** includes the following modules:

#### Introduction

- 3G Specifications

- Introduction to 3G Networks

- Conceptual, Structural, Resource Management & Services.

#### Evolution

- Evolution from GSM to UMTS

#### Basics of UMTS Radio Communications

- Radio Communications Fundamentals

- Cellular Radio Communications

- Multiple Access Techniques

- Essentials of 3G Radio Path

- Frequency Bands

- Basic Concepts

- WCDMA Radio Channels

- WCDMA Frame Structure

#### UMTS Radio Access Network (UTRAN)

- Base Station

- Base Station Structure

- Modulation Methods

- Receiver Techniques

- Cell Capacity

- Radio Network Controller

- Radio Resource Management

- UTRAN Control Functions

#### Services in UMTS

- Services & the Commercial Model

QoS  
QoS Classes  
QoS a Provocative Approach  
Service Capabilities as UMTS Service Platforms  
WAP  
LCS  
MexE  
USAT  
CAMEL SCE  
Service Capabilities as Building Blocks  
UMTS Services & Service Concepts  
Conversational QoS Class  
Streaming QoS Class  
Interactive/Background Class  
Virtual Home Environment

Security in the UMTS Environment  
Mutual Authentication  
Cryptography for Authentication  
Temporary ID  
UTRAN Encryption  
Integrity Protection  
Security Aspects on the System & Network  
IPSEC  
MAPSEC  
Typical Security Attacks  
Protection of Applications & Services  
Application Layer Security  
Security of Session Layer  
AAA Security Mechanisms  
IMS Security  
Lawful Interception

UMTS Protocols  
Protocol Reference Architecture  
Radio Interface Protocol Reference Model  
UTRAN Protocol Ref Model  
CN Protocol Ref Model  
UMTS Protocol Inter-working Architecture  
Transport Network Protocol Aspects  
Transport Network  
Physical Layer  
Traffic Flow  
Signaling Transport within the CN  
IP Option for Signaling Transport  
Radio Network Protocols  
Radio Network Control Plane  
Radio Network User Plane

System Network Protocols  
Non-Access Stratum Protocols  
Control Plane between CN Nodes  
User Plane in the System Network

Procedure Examples

Protocol Reference Architecture  
Radio Interface Protocol Reference Model  
UTRAN Protocol Ref Model  
CN Protocol Ref Model  
UMTS Protocol Inter-working Architecture  
Transport Network Protocol Aspects  
Transport Network  
Physical Layer  
Traffic Flow  
Signaling Transport within the CN  
IP Option for Signaling Transport  
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User Plane in the System Network

Paging

RRC Connection Set-Up  
Transaction Reasoning  
Authentication & Security Control  
RRC Connection Release  
Soft Handover  
Inter-System Handover from UMTS to GSM Circuit Switched  
Cell Update  
Location Update to the CN CS Domain  
Routing Area Update to the CN PS Domain  
Packet Data Example