UMTS, HSPA & HSPA+ (3 days)

3G

3GPP UMTS (Universal Mobile Telecommunications System) is designed to fulfill high quality of service requirements for rapidly growing internet applications and to provide higher data rates to access a full range of services and applications. 3GPP Release 5, 6 & 7 introduce new DL/UL transport channels and features including MIMO that enhance support for high-performance packet data applications. A good knowledge of cellular technologies like GSM would be beneficial for anyone attending this course.

Who Should Attend

This is beginner level course and suitable for telecom professionals & students who have no understanding of UMTS.

Objective

After completing this course, the audience will be able to:

- Understand UMTS architecture & protocols
- Define UMTS interfaces
- Describe HSDPA/HSUPA/HSPA+ enhancements
- Explain Signaling procedures

Course Contents

UMTS Overview

UMTS Air Interface

- Physical Radio channel
- Spreading
- OVSF code generation
- Scrambling codes
- UL/DL Physical Channels
- Physical Layer Procedures
- RLC/MAC/RRC

UTRAN Architecture & Functions

UTRAN Iu/Iur/Iub Interfaces

UMTS Signaling

- RRC Procedures
- Location Update/ CS/PS Call
- Mobility

HSDPA

HSDPA Features

- Shared channel transmission
- Adaptive Modulation and Coding (AMC)
- H-ARQ
- Fair and fast scheduling at Node B
- Fast cell selection (FCS)
- Short transmission time interval (TTI)

HSDPA Channels

HSDPA Protocol Architecture

MAC Architecture

HSDPA Operations & Mobility Procedures

HSUPA

HSUPA Features

- Multi code transmission
- Short Transmission Time Interval
- Fast hybrid Automatic Repeat reQuest
- Fast scheduling

HSUPA Channels

UTRAN Iub/Iur Protocol Aspects

HSUPA Protocol Architecture

MAC Architecture

UTRAN Iub/Iur Protocol Aspects

HSUPA Protocol Architecture

MAC Architecture

HSUPA Operations & Mobility Procedures

HSDPA/HSUPA Terminals

HSPA+

HSPA+ Overview

Throughput Enhancement Features

- Multiple Input / Multiple Output (MIMO)
- Continuous Connectivity for Packet Data Users (CPC)
- 64 QAM for HSDPA in DL
- 16 QAM for HSUPA in UL
- Improved Layer-2 Support for High Data rates

Evolved HSPA Architecture

Latency and Power Enhancement Features

- Continuous Connectivity for Packet Data Users (CPC)
- Enhanced Cell FACH

- MAC Enhancements

Interworking, and Beyond Release 7