

3GPP Release 5, 6 & 7 introduce new DL/UL transport channels and features including MIMO that enhance support for high-performance packet data applications. HSPA+ doubles the data speed supported by HSPA. This course provides a good understanding of HSDPA, HSUPA & HSPA+ air interface features and protocol (e.g. RLC, MAC) changes. A good knowledge of 3GPP UMTS would be beneficial for anyone attending this course.

Who Should Attend

This is advanced level course and suitable for telecom professionals including design, testing, support & sales engineers who already have good understanding of UMTS technologies.

Objective

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

- Understand HSPA/HSPA+ features
- Describe HSDPA/HSUPA/HSPA+ channels/technology
- Describe protocols (e.g. RLC, MAC) changes
- Explain Signaling procedures

Course Contents

UMTS Overview

HSDPA

- Benefits
- Applications
- Architecture

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

- High Speed Shared Control Channel
High Speed PDSCH
- High Speed DPCCCH

HSDPA Protocol Architecture

MAC Architecture

HSDPA Operations & Mobility Procedures

HSUPA

Introduction

- HSUPA Overview
- HSUPA Enhancements
- UMTS Architecture with HSUPA

HSUPA Features

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

HSUPA Channels

- Enhanced Uplink Dedicated Channel E-DCH E-DPDCH
- E-DCH DPCCCH

UTRAN Iub/Iur Protocol Aspects

HSUPA Protocol Architecture

MAC Architecture

HSUPA Operations & Mobility Procedures

- HSUPA Serving cell change
- Intra-Node B Synchronised serving E-DCH cell change
- Soft Handover

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 with legacy UTRAN nodes
HSPA+ Release 8 enhancements