

3GPP Release 7 Specifies HSPA Evolution (HSPA+), which includes higher order modulation and MIMO. Radio enhancements to HSPA include 64 QAM in the downlink DL and 16 QAM in the uplink. This course provides a good understanding of HSPA+ air interface technologies, protocols & architecture changes. A good knowledge of 3GPP UMTS/HSPA 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/HSPA technologies.

## Objective

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

- Understand HSPA+ features
- Describe HSPA+ channels/technology
- Describe protocols, architecture changes
- Explain Signaling procedures

## Course Contents

### UMTS Overview

#### HSPA

- Overview of HSDPA/HSUPA
- HSPA goals
- HSPA approach

#### HSPA+ Overview

- Evolution
- HSPA+ challenges
- HSPA+ benefits
- Impact of HSPA+ on UE and network

### Throughput Enhancement Features

- Multiple Input / Multiple Output (MIMO)
- Continuous Connectivity for Packet Data Users (CPC)
  - DTX
  - DRX
- 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)
  - DTX
  - DRX
- Enhanced Cell FACH

### MAC Enhancements

- Overview
- MAC-e-hs architecture (UTRAN side)
- MAC-e-hs architecture (UE side)

### Interworking, and Beyond Release 7

- Interworking with legacy UTRAN nodes
- Signaling
- HSPA+ Release 8 enhancements