

# LTE R8 RADIO NETWORK DESIGN PRINCIPLES

## Course Description

LTE, long term evolution introduces new opportunities as well as challenges. Great spectrum flexibility and spectrum allocation alternatives contribute to the complexity. The new OFDMA radio standard requires new or updated design principles, compared to UMTS/WCDMA. Cell edge performance can no longer rely on soft handover, while Inter-cell interference levels still must be taken into account. Multi-antenna installation using MIMO will contribute to capacity increase in some occasions, while in others situations, beam-forming techniques will be used.

This course will exploit the new opportunities in the radio design area. Guidelines will be explained and concrete examples will be given.

## Who should attend?

Target audience is radio engineers and project managers as well as network architects.

## Course content

### EVOLVED PACKET SYSTEM (EPS) ARCHITECTURE

- E-Utran and EPC systems
- Interfaces and protocols
- Comparison with UMTS/WCDMA
- Capabilities/system limitations

### LTE AIR INTERFACE PRINCIPLES

- Subcarriers and resource blocks
- Flexible allocation of spectrum
- LTE channel structure: logical, transport and physical channels
- Elementary procedures in LTE radio (X2 and S1)

### LTE TRAFFIC TYPES AND THEIR CHARACTERISTICS

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#### LTE DIMENSIONING

- Uplink coverage and capacity dimensioning
- Downlink coverage and capacity dimensioning
- Noise rise and throughput at cell edge
- Link budget and site count
- simple dimensioning example
- average bit-rate and cell throughput calculations

#### LTE CELL PLANNING

- Load vs SINR examples
- Resource Block data rates for uplink and downlink
- LTE Neighbour analysis
- ICIC and neighbour list updates
- Handover and cell change measurements
- Thresholds criteria for cell change and handover initiation

#### TOOLS AND SIMULATIONS

- Simulation methods and assisting tools in LTE radio design and dimensioning

### **Pre-requisites**

The participants should have basic LTE knowledge

### **Course length**

2 days

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