LTE Advanced

Course No. 1434                     Duration: 1 day

Course Overview:
The course dives into specifics of the LTE-Advanced PHY layer. A discussion of the main differences between LTE and LTE-Advanced is presented, followed by an in-depth discussion of the various implications of MIMO schemes and carrier aggregation on the downlink and uplink channels and signals within LTE-Advanced. The course ends with a review of the challenging problem of high-dimensionality MIMO detection which is highly important in LTE-Advanced.

Who should attend
The seminar is built for Technical, Marketing and Business Development people of the Telecom Service Providers as well as Manufacturers of LTE-Advanced equipment.

Prerequisite
Basic knowledge of telecommunications is expected from the participants, as well as familiarity with LTE.

Course Content:

1. Short Review of LTE (Releases 8 & 9)
2. LTE Advanced Requirements and Differences from LTE
   • Spectral Efficiencies, Max Throughput
   • UE Categories
   • HARQ & Memory Requirements
   • Competing Technologies (802.16m, 802.11ac)
3. Carrier Aggregation
   • Component Carriers (Primary, Secondary)
   • Downlink Control with Carrier Aggregation
   • Synchronization Issues
4. Downlink Transmission
   • MIMO Modes
   • Reference Signals with emphasis on new Signals (CSI, CRS, DM-RS)
   • Channel Estimation
   • Random Matrix Precoding
5. Uplink Transmission
   • New MIMO Modes
   • SORTD and Layer Shifting
   • Reference Signals and Orthogonal Cover Codes
   • The Significant Impact on Channel Estimation
   • Sounding & PUCCH - Multiple Antenna Transmission
6. Downlink Control
   • Implications of Carrier Aggregation
7. Uplink Control
   • New Control Formats
8. CQI & Link Adaptation
   • Implications of Large Order MIMO
   • Wideband & Narrowband Precoding
   • Precoder Selection
9. Coordinated Multi-Point (CoMP) Transmission and Reception
   • Joint Downlink Transmission
   • Joint Uplink Processing
   • Coordinated Scheduling/Beamforming
10. High Order MIMO Schemes
    • High Dimensionality OFDMA Detector for the Downlink
    • High Dimensionality SC-FDMA Detector for the Uplink
    • The SIC Assumption
11. Summary