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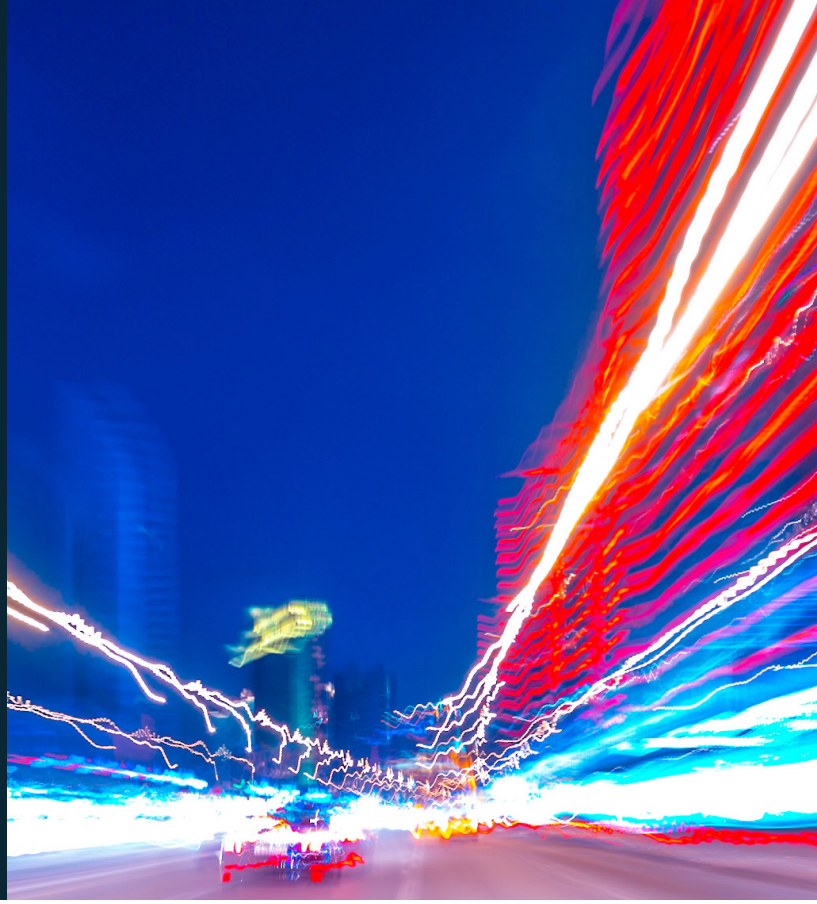
Innovating Telecoms Training

> Interesting and informative course. Well presented. Thank you.

Watch our course intro video.



LTE Carrier Aggregation and MIMO

Course Description

Focusing on the enhancements brought about by the introduction of LTE Advanced, this course explains the modifications and benefits to the air interface in terms of supporting carrier aggregation and MIMO. In so doing, the key carrier aggregation procedures are explored, including the impact this has had on mobility within the network. MIMO and its impact and usage within LTE is also a key topic which is explored.

Prerequisites: LTE Air Interface, or equivalent knowledge.

4	4	
Hours Learning (OnlineAnytime)	**CPD Learning Credits**	**Level: 3 (Advanced)**

This course will contain the following sections:

1. LTE Advanced Fundamentals

Topic areas covered include:

- LTE-Advanced.
- LTE-Advanced Release 10:
    - Carrier Aggregation.
    - MIMO Enhancements.
    - Relay Nodes.
    - MDT (Minimization of Drive Testing).
    - Logged MDT.
    - Immediate MDT.
    - Enhanced Inter-Cell Interference Coordination.
    - ICIC Options.
    - eICIC - ABS Information.
    - Machine Type Communications:
        - MTC.
    - Selected IP Traffic Offload:
        - SIPTO.
    - Local IP Access:
        - LIPA.
- Release 11 LTE-Advanced:
    - Carrier Aggregation in Release 11.
    - MDT in Release 11.
    - Coordinated Multi-Point.
    - CoMP Scenarios.
- Release 12 LTE-Advanced:
    - Dual Connectivity.
    - Carrier Aggregation in Release 12.
    - Small Cell Enhancements.
    - Proximity Services.

2. Carrier Aggregation

Topic areas covered include:

- Introduction to Carrier Aggregation.
- Carrier Aggregation Terminology:
    - Component Carriers:
        - CC PCC and SCC.
        - PCell and SCell.
    - CA Band Allocation Terminology.
    - Band Class.
- CA Evolution.
- UE CA Capabilities.
- CA Operation:
    - CA Procedures.
    - MAC CA Procedures.
    - CA Scheduling.
- CA Mobility:
    - PCC and SCC Handover.

3. MIMO Enhancements

Topic areas covered include:

- What is MIMO?
    - Defining MIMO.
- MIMO Benefits:
    - Single Stream vs Dual Stream.
    - Spatial Multiplexing.
    - Antenna Complexity.

4

CPD Learning Credits

ITP

ITP accredited course

OnlineAnytime

MIMO Enhancements (cont.)

- MIMO Transmission Modes:
  - Downlink Transmission Modes.
  - Uplink Transmission Modes.
- MIMO Operation:
  - Reference Signals.
  - Two Antenna Port Configuration.
  - MIMO Antenna.
  - MIMO 8x8 Reference Signals.
  - LTE Channel.
  - Condition Number and Rank.
  - Codewords, Rank, Layers and Antenna Ports.
  - MIMO Precoding.
- Configuring MIMO:
  - Antenna Information.
  - UE Capabilities.
  - Downlink Scheduling.
  - Uplink Scheduling.
  - MIMO Feedback.

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