5G Overview	1 Days

LEARNING OBJECTIVE:

Modules is focused on the development and applications of 5G NR and getting prepare for the future. State of 4G wireless and upgrades , 5G application scenarios , Key 5G technologies , 5G spectrum , Timeline for standardization

TARGET AUDIENCE :

Network Engineers, Non-Technical/Technical Manger Planning and Optimization Experts, Technical Consultants and others

COURSE OUTLINE :

1. 5G Fundamentals

1.1 Salient Features of the 5G

1.1 a) Peak data rates
1.1 b) URLLC and MTC
1.1 c) Wider bandwidths
1.1 d) Network capacity expansion
1.1 e) New signal processing practices

1.2 Spectrum and coverage implications

1.2 a) Millimeter waves
1.2 b) Spectrum for coverage and capacity
1.2 c) Future Spectrum

1.3 a) **Areas of Interest**

- ➢ Signal processing techniques for massive MIMO/large scale MIMO systems
- ➢ Signal processing techniques for C-RAN/DAS

2. Air-interface technology evolution

2.1. Network related evolution.

2.1 a) Next Generation Wireless Technologies

2.2 Key technologies

2.2 a) 5G wireless will support a heterogeneous set
2.2 b) Simultaneous radio access technologies to increase reliability and availability

2.3 5G Network Implementation Plan Inter connectivity

2.3 a) Standalone (SA) deployments
2.3 b) Non-Standalone (NSA) deployments

2.4 5G – Technology Enablers

2.5 Massive MIMO & Beamforming

2.5 a) Single user MIMO & Multi-user MIMO
2.5 b) Massive MIMO Key Features
2.5 c) Explanations

3. Future wireless challenges

3.1 Future Challenges

3.1 a) IoT and number of connections
3.1 b) Data volumes
3.1 c) Increasing capacity without increasing cost
3.1 d) Fast and flexible deployment architecture.
3.1 e) Real-time information for critical services
3.1 f) Coping with augmented reality
3.1 g) M2M and automotive
3.1 h) Device-to-device
3.1 i) Air interface
3.1 j) Network densification

3.2 Physical layer procedures

Layer 2 protocol

3.2 a) Synchronization procedures
3.2 b) Radio link monitoring
3.3 c) Link recovery procedures
3.3 d) Uplink Power control

4. New applications

4.1 Applications

4.2 High-speed mobile network

4.3 Entertainment and multimedia

4.4 Internet of Things – Connecting everything

4.3 a) Smart Home
4.3 b) Logistics and shipping
4.3 c) Smart farming
4.4 d) Autonomous Driving

5. New applications

5.1 a) 3GPP 5G standardization Status update;
        groups,
5.2 b) key meetings, timeline
5.3 c) 3GPP 5G standardization Status update;
        groups, key meetings, timeline