

Demystifying 5G

Duration: 16 Hours

Course Contents

- **Overview of 5G Training**
 - 5G Standardization and Technology Options
 - Analysis of 5G Use Cases
 - 3GPP 5G NR, and Next GenCore
 - ITU's IMT2020
- **5G Applications**
 - Enhanced Mobile Broadband (eMBB)
 - Massive Machine Type Communication (MTC)/ Massive IoT
 - Ultra-Reliable and Low Latency Communication (URLLC)
 - Critical Communications and Public Safety
 - Autonomous Driving
 - Vehicle to Vehicle (V2V) communication
 - Smart Grid
 - Smart City
- **3GPP LTE-A and LTE-A Pro Evolution into the 5G**
 - eLTE eNB: evolution of eNB that supports connectivity to EPC and NextGen Core
 - NR: New Radio
 - gNB: NR node
 - NextGen Core
 - mmWave principals in 5G
 - Millimeter Wave (mmW) Technology
 - Introduction to mmW
 - Millimeter wave definitions for 5G
 - Performance of a typical 5G wireless system
 - mmW Modeling and Simulation
 - mmW Systems Engineering
 - Beamfoaming in 5G
 - NG: The interface between gNB and a NextGen Core
- **LTE / LTE – Advanced Introduction**
 - Carrier Aggregation (CA)
 - Dual Connectivity (DC)
 - LTE Unlicensed / LTE License Assisted Access (LAA)
 - LTE-WiFi Radio Level Aggregation (LWA)
 - LTE Broadcast / Multicast Techniques and Future Terrestrial TV
 - Group Communication Service Enabler (GCSE)
 - Discovery and Device to Device (D2D) for Proximity Services
 - Proximity Service Architecture and Protocol

- Architecture Enhancements for V2X Services
- LTE Machine Type Communication for Internet of Things
- New LTE Access Scheme: Narrowband Internet of Things (NB-IoT)
- **5G Wireless Requirements, Applications, and Services**
 - 5G New Radio (NR)
 - 5G Next Generation System Architecture
 - MTC enhancements
 - small cell dual-connectivity and architecture
 - carrier aggregation enhancements
 - Interworking with Wi-Fi
 - Licensed assisted access (at 5 GHz)
 - 3D/FD-MIMO
 - Indoor positioning
 - Single cell-point to multi-point
- **5G Integration with 802.11ax, 802.11ay and 802.11az**
 - Licensed Assisted Access (LAA)
 - 5G and Wi-Fi Offload
 - LTE-U, LAA and LWA
 - Full Dimension MIMO (FD-MIMO)
 - TDD / FDD Evolution
 - LTE-A/Pro Broadcast
- **5G Technology Enablers**
 - Public Safety applications with 5G