

CDMA + UMTS & 3G RF Engineering

Pre-request: GSM, GPRS and EDGE Course

Course duration: 36 Hours

On completing this course you will be able to:

- understand and explain CDMA Concepts.
- understand and explain UMTS Concepts, Network Architecture, Air Interface and protocols
- Pass any 3G interview to work in any mobile operator, vendor or Sub-contractor
- Make any graduation project based on 3G mobile communications
- Knowing the RF Career path and basics of Drive testing For 3G

Course Content:

Part I 3G Survey

CH1: Fundamentals of CDMA

- Access Techniques
- SDMA VS CDMA
- Spreading and de-spreading
- CDMA Key features
- PN codes
- Multi users systems
- CDMA system performance
- Rake receiver

CH2: UMTS Evolution & Air interface

- UMTS Appearance
- UMTS proposals
- UMTS Codes
 - Channelization
 - Scrambling
 - Synchronization
- UMTS bands
- UMTS Channels

CH3: The UMTS Network

- Appearance of UTRAN
- Circuit switching domain
- Packet switching domain
- Radio access network
- Site upgrading
- Sites types
- Coverage comparison

CH4: UMTS Transmission Chain

- Source coding
- Channel coding
- Interleaving
- Ciphering
- Bit mapping
- Channelization
- Complex scrambling
- Modulation

CH5: UMTS Protocols

- Power control
- Multi-users detection
- Admission control
- Handover
- Location based services
- Introduction to HSPA

Part II 3G RF Engineering

- What is the Drive Test and why we need it
- Types of the different sites
- Mechanical and electrical tilt and its effects
- Types of the tests (2G & 3G)
- Cell file
- Tools used in the DT
- Field problem that should be detected by the DT

- 3G (Case analysis)
 - Overshooting
 - Cross sector
 - Cross feeder
 - Missing neighbor
 - Dropped call.
 - Blocked call.
 - Pilot pollution
 - HO from UTRAN failure