Certificate Course in Advanced Mobile Communication Technologies (3G 4G)

Course Objective

This course aims at providing the participants with a comprehensive knowledge in 2G, 3G and 4G technologies. Practical training provided during the course on Network Elements will give the participants much need hands-on experience

Course Outcomes

On completion of this course the participants will be able to:

- Understand Telecom and datacom fundamentals
- Explain Network structures & Key technologies involved in GSM, CDMA, WCDMA & LTE technologies
- Excel on Call flows involved in GSM, CDMA, WCDMA & LTE
- Understand RF concepts involved in Wireless telecommunication
- Understand how does telecom industry provide services to millions of people

Target Audience

Officials from ICT Ministry, Telecom Companies, Universities, Colleges, Telecom allied service companies etc.

Teaching Methodology

This course is based on both theoretical lessons and practical exercises

Prerequisites

Graduates / Engineers / Diploma Holders in Electronics / Electrical / Communications / Telecom or Equivalent with prior Telecom Knowledge

Duration : 10 Weeks (5 days a week , 4 - 6 hours per day)

Batch 1 – 03-07-2017 to 09-09-2017

Batch 2 – 30-10-2017 to 06-01-2018

Course Outline

Telecom and Datacom Fundamentals

- Communication Fundamentals, Understanding of Wired & Wireless systems Electromagnetic Spectrum, Frequency, Velocity, Wavelength, Bandwidth
- Transmission media - Twisted pair, Coax, Fiber, Satellite and LOS
- Modulation methods, Multiplexing techniques, Antennas theory and characteristics
- Introduction to LAN's, MAN's and WAN's, IEEE standards, Switching concepts, T1/E1 standards, X.25, ATM and Gigabit Ethernet
- IP Addressing IPv4 and IPv6 concepts.

Global System for Mobile communication and Signaling System

- FDMA, TDMA, CDMA, Introduction to cellular concepts Wireless Generations: 1G, 2G, 3G, Frequency ranges,
- GSM Architecture MS, BSS, MSC, Transcoder, HLR, VLR and other network elements
- Authentication, Channels on Air-Interface, Handovers, Time slot and Frame structure
- Call process procedures and Transmission process, Traffic Engineering, SS7 signaling, Architecture nodes, Protocol stack, Signal units and Call setup
- Configuration of cell site, Drive Test and RF planning

IS-95A standard and CDMA 2000 1x

- Introduction to CDMA, Spread Spectrum techniques, DSSS, FHSS, THSS. Pseudo noise sequence, Diversity, Orthogonal codes, Walsh codes
- Architecture, Forward and Reverse Links, Handoff, Power control, Call processing and Speech coding
- Evolution of IS-95A to CDMA 2000 1x, Physical and logical channels, Call processing and services. 1x EVDO Architecture, Channels in EVDO and Call procedures

3G Technologies

- Introduction to packet switching, GPRS network elements, GPRS attach & PDP context activation, EDGE concepts
- Introduction to WCDMA, Radio channels, Frame structure, Enhancements in WCDMA, UTRAN Architecture, Node-B, RNC, Core network, IMS , Services and security
- UMTS protocols and Procedure Examples, UMTS Radio network planning and dimensioning, Coverage issues, Link budget & tools for planning, the move towards 4G
- WLAN standards, WLAN concepts, WLAN architecture WiMax

4G Technologies

- Introduction to LTE, Goals and market drivers, Network architecture, e-UTRAN and EPC, roles of UE, eNB, MME, S-GW, P-GW and HSS, Interfaces S1, X2, S6a, S5 and S11
- LTE air interface, Orthogonality, OFDM, MIMO, Antenna Considerations.
- LTE services - CS-Fall back, VoLTE and SR-VCC, SMS support, Interworking with 2G/3G wireless networks, Wireless Mobility in LTE.

Case study: UTL has installed more than 2 million GSM lines and 2 million CDMA lines. A study of the installation techniques, practical problems faced on the field, Do's and Don'ts for the installation etc., will be dealt in the case study.

Industry training: UTL is associated with Operators and OEMs for conducting Industrial / Practical Training on Mobile Communication equipment's for participants

For more details and procedure to apply for scholarship : **http://www.utltraining.com/itec-scaap/**