

TECHNOLOGY LEARNING CENTER

..Finishing School for Engineer's

TELECOMMUNICATION WORKSHOP PROPOSAL

We at Pioneer Telecom deliver knowledge transfers and train prospective engineers and professionals, addressing the opportunities created by the staggering demand for exposure to Telecommunication, latest and Advanced Networks, such as GSM, GPRS, EDGE, and WCDMA. We deliver comprehensive, cutting edge live projects on all aspects of Telecommunication. **LIVE** is the one word that separates us from the rest and it does speak for itself. In Terms of Guidance and Knowledge Transfer we have our Best Team who have worked for Major vendors (NSN, Huawei & Ericsson) with Global experience which will help us to reach beyond the role of a Traditional Institution.

Headquartered in Hyderabad, with resource centers in GLOBLE we are a growing company whose underlying motivation is to help you address your challenges and overcome them with Strategic and Meta-Analytical approach which is the core of our fundamentals.

Since inception our focus has been on you, the student; to nurture our students and develop them into exceptional Telecom professionals. Technology and Innovation are the tools we use to help you grow and achieve your goals.

We undertake Academic projects for ECE, IT, CSE and EEE Branches in different academic institutions.



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Telecom Workshops

We also conduct workshops on emerging technologies in the Telecom Industry, and hence providing the students an opportunity to know the various aspects of a Telecommunication system, and effectively bridging the gap between the academics and the Industry demands and standards.

These workshops are designed to make the students familiar with the latest Technologies such as:

GSM, GPRS, EDGE (EGPRS)

WCDMA: UMTS-FDD, UMTS-TDD, HSDPA, HSUPA and HSPA+

LTE - 4G: A comprehensive look at the Next Generation Advanced Mobile Networks.



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Telecommunication Workshop on GSM/WCDMA/HSPA/HSPA+

This comprehensive workshop is a through introduction to the NextGen Telecommunication Networks and Legacy Networks such as (GSM/WCDMA/HSPA/HSPA+).

The emphasis is on understanding the various nodes that comprise the Network architecture of the above mentioned technologies and know the functions of each node. This workshop addresses the challenges faced in rolling out a network from ground-up. Evaluating the Key Performance Indicators (KPI) and optimizing the network to provide optimum coverage and capacity. The information gained can be applied to troubleshoot any issues affecting the KPI targets like Handover Failures, Dropped-Calls and lower Cell Throughput. This workshop combines insightful lectures with practical lab exercises to reinforce key concepts. You will also learn advanced HIGH-SPEED cellular networks like HSPA, HSPA+ techniques that will increase your overall proficiency and enhance your understanding of Modern day telecommunication Networks.



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Duration:

It's a two day workshop. In this two-day course, you will gain valuable hands-on experience. Incoming students with little or no Telecommunications systems Knowledge will finish this workshop empowered with the ability understand and troubleshoot the KPI's which are essential in providing optimum performance to the operator and better Grade of service to the end-subscriber.

Who Should Attend?

Engineering students (preferably 3rd & 4th year) who want to gain an understanding and *real-time hands-on* experience on the functionality of the legacy networks like GSM / WDMA and NextGen networks such as LTE & LTE-A.

Workshop Modules:

1. Cell Selection/Reselection

Cell reselection quality measure.

2. The Basic Concepts of Handover



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Active Set, Monitored Set, Detected set, Radio Link (RL), Radio Link Set (RLS) Soft handover (softer handover) and Hard handover Intra-frequency handover, Inter-frequency handover, Inter-RAT handover (UMTS ↔ GSM/GPRS), Coverage based Handover

4. Measurement Control

Measurement quantity and report mode

Handover event type - 1A, 1B, 1C, 1D and key parameters

Compressed mode

Inter Frequency measurement and event 2D, 2F

Measurement of IRAT handover and event 3A, 3C

5. Power Control

- Open loop power control
- Closed loop power control

After completing this workshop, you will be able to understand:

- GSM/WCDMA Network architecture
- GSM/WCDMA Channels
- Radio parameters
- Cell parameters



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3GPP Release 5 standards introduced enhanced DL bit rates with

High Speed Downlink Packet Access (HSDPA) technology

- Shared high bit rate channel between users - High peak bit rates
- Simultaneous usage of up to 15 DL channelization codes (In HSDPA SF=16)
- Higher bit rate in same band
- Higher order modulation scheme (16-QAM)
- 16-QAM provides 4 bits per symbol
- 960 kbit/s / code physical channel peak rate

A Complete understanding of LTE-SAE Architecture

- LTE Concepts
- MIMO
- SON, ANR
- VoLTE, SR-VCC
- LTE Radio challenges



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Practical Sessions:

Day 1: Complete DT Measurements and Analysis on TEMS

Investigation

- Analyzing Live Measurements on TEMS
- RF Parameters Study
- BCCH/BSIC Analysis
- RX LEVEL, RX Quality and C/I Measurements Analysis
- FER, BER, SQI Analysis
- Timing Advance Observations
- Exporting the Drive Test to Map Info and Google Earth for Analyzing

Day2: Complete Frequency Planning and Neighbour Planning on MapInfo

- BCCH and BSIC Planning on MapInfo
- BCCH Plan Review
- Neighbour Planning
- C/I Interference Analysis



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Benefits of the participants

- **Certificate of Participation** to all Participants from Technology Learning Center
- **Free Softcopy of workshop content**
- Technology Learning Center summer Training Redemption Coupon

Our Requirement for the program:

- Minimum of 50 teams for conducting the workshop
- One Computer CD-ROM drive for each team or students are requested to get their laptop preferably with Windows OS.
- LCD projector and microphone PA system.
- Seminar hall or computer lab for conducting the workshop.

Workshop Duration:

- 2 Days [7 Hours/Day]

Pre-requisites:

The modules are designed in order to cater the basics of Robotics and coding however following pre-requisites will be an added advantage.

- Basic knowledge of communication systems.
- Basic Electronics.

