
COURSE DESCRIPTION

COURSE TITLE

4G LTE RF Planning & Design

COURSE NUMBER

PTFS 020

TARGET AUDIENCE

- ✓ People who has an access to daily cellular telecommunication maintenance and operation activity
- ✓ Telecommunication Teacher or Lecturer

PREREQUISITES

Students attending this class must have fundamental electrical and telecommunication knowledge and one year on the-job cellular telecommunication experience.

COURSE DURATION

2 Days

COURSE OUTLINE

4G LTE RF Planning & Design

This training presents difference between 2G, 3G and 4G, network architecture and their radio technology. It will explain detail concept about OFDMA and SC-FDMA. It will explained about coverage and capacity planning depends on LTE RF deployment strategy. This training also presents how to design 4G LTE network with Planning tool. Create and calibrate propagation models, and also allocate RF configuration parameters like PCI, neighbours, Antenna parameters, Transmitters parameters, Cell parameters, MIMO Settings, Settings ICIC for LTE networks in Planning tool.

SYLLABUS & PROGRAM AGENDA

4G LTE RF Planning & Design

Day	Training Module	Syllabus	Objectives
Day 1 4G RF Fundamental	<p>Session 1 : Radio Cellular Technology</p> <p>Session 2 : OFDMA</p> <p>Session 3 : SC-FDMA</p> <p>Session 4 : Peak Capacity of LTE</p> <p>Session 5 : Physical Channel in LTE</p>	<p>09.00-09.30 :</p> <ul style="list-style-type: none"> Opening Pre-Test Participant Introduction <p>09.30-10.00 :</p> <ul style="list-style-type: none"> Radio Cellular Technology Network Architecture Cellular Frequency Allocation <p>10.00-10.15 (Coffee Break)</p> <p>10.15-12.00 :</p> <ul style="list-style-type: none"> OFDM and OFDMA LTE Downlink OFDMA time-frequency multiplexing LTE Spectrum Flexibility LTE Frame Structure type 1 (FDD), downlink LTE Frame Structure type 2 (TDD) Quiz <p>12.00-13.00 (Lunch)</p> <p>13.00-14.30 :</p> <ul style="list-style-type: none"> Introduction to SC-FDMA and UL Frame Structure How to generate SC-FDMA? How does SC-FDMA signal look like? SC-FDMA Signal Generation SC-FDMA PAPR SC-FDMA Parameterization <p>14.30-15.00 :</p> <ul style="list-style-type: none"> MIMO Antenna Quiz <p>15.00-15.30 (Coffee Break)</p> <p>15.30 -17.00 :</p> <ul style="list-style-type: none"> LTE Radio Channel <ul style="list-style-type: none"> LTE Logical Channel LTE Transport Channel LTE Physical Channel DL Control Channel Dimensioning User Data Rate (PDSCH) Power Usage 	<ol style="list-style-type: none"> Participants were able to define the difference between 2G, 3G and 4G. Participants understand the network architecture in LTE 4G. Participants understand the concept of OFDMA and SC-FDMA. Participants can calculate the data rate on the LTE network in a variety of network configurations

Day	Training Module	Syllabus	Objectives
Day 2 4G RF Planning	<p>Session 6 : Coverage Planning</p> <p>Session 7 : Capacity Planning</p> <p>Practice Session 1 : Data Preparation for LTE Design</p> <p>Practice Session 2 : Modelling an LTE Network</p> <p>Practice Session 3 : LTE Predictions</p>	<p>09.00-09.30 :</p> <ul style="list-style-type: none"> • <i>Session Review</i> <p>09.30-10.00 :</p> <ul style="list-style-type: none"> • <i>UL Link Budget & Parameters</i> • <i>DL Link Budget & Parameters</i> • <i>Quiz</i> • <i>Propagation Model</i> • <i>Quiz</i> • <i>Cell Radius</i> • <i>Nominal Planning</i> • <i>Quiz</i> <p>10.00-10.15 (Coffee Break)</p> <p>10.15-12.00 :</p> <ul style="list-style-type: none"> • <i>Number of user</i> • <i>User density</i> • <i>Services and type</i> • <i>Penetration : building, vehicular, pedestrian</i> • <i>BHCA and call duration</i> • <i>OBQ</i> • <i>Site calculation</i> • <i>Quiz</i> <p>12.00-13.00 (Lunch)</p> <p>13.00-15.00 :</p> <ul style="list-style-type: none"> • <i>Import of heights map</i> • <i>Import of clutter map</i> • <i>Import of vector map</i> • <i>Setting a coordinate system</i> • <i>Network data setting</i> • <i>Import of the Sites table</i> <p>15.00-15.30 (Coffee Break)</p> <p>15.30 -16.30 :</p> <ul style="list-style-type: none"> • <i>Antenna parameters setting</i> • <i>Transmitters parameters setting</i> • <i>Cells parameters setting</i> • <i>MIMO Settings</i> • <i>ICIC Settings</i> • <i>Smart Antenna Settings</i> • <i>Propagation model</i> • <i>SPM propagation model</i> • <i>Set the propagation model for each transmitter</i> • <i>Automatic calibration of the Cost-Hata model</i> • <i>Set the propagation model for each transmitter</i> <p>16.30 -17.30 :</p> <ul style="list-style-type: none"> • <i>Setting the Computation Zone</i> • <i>Propagation and prediction studies calculation</i> • <i>Best server prediction</i> • <i>Coverage by Signal Level prediction</i> • <i>Overlapping Zones prediction</i> 	<p>1. Participants were able to prepare the necessary data for designing LTE network.</p> <p>2. Participants were able to perform network modeling LTE (Antenna parameters, Transmitters, Cell parameters, MIMO Settings, Settings ICIC).</p> <p>3. Participants are able to create and calibrate propagation models for LTE networks</p>

NOTES

This Course Description is subject to change due to product design changes and individual attendee needs and experience.