PT. Floatway Systems
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COURSE DESCRIPTION

COURSE TITLE
4G LTE RF Planning, Drivetest & Optimization

COURSE NUMBER
PTFS 012

TARGET AUDIENCE
People who has an access to daily cellular telecommunication maintenance and operation activity

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

COURSE DURATION
4 Days Classroom Training + 5 Days On Job Mentoring (Total 9 Days)

With schedule like below :

Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9
Classroom Training + Practice	Classroom Training + Practice	On Job Mentoring + Preparing Drivetest Study Case Report					Classroom Training + Presentation	Classroom Training

COURSE OUTLINE

4G LTE RF Planning
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.

4G LTE Drivetest
In Drivetest Session participants will understand Drivetest measurement and analysis of LTE network coverage, will be able to conduct LTE Drivetest both on Single site verification test and also cluster drive test, will be able to create final report for Single site reporting and cluster drive test Reporting and will be able to present Drivetest Problem, Root Cause Analysis and Action plan for problem solving.

4G LTE RF Optimization
In Optimization session it teaches how to monitor performance of the LTE Radio Access Network. It talks about the Key Performance Indicators (KPI) that should be used. In this course students will be introduced to the LTE radio network analysis and associated KPI formulas. They will be guided through LTE system statistics, operational measurements, data field examples, and key performance indicator and measurement. Furthermore LTE optimized field tools and how to examine LTE message/events records will be introduced. It also presents about RF Configuration Parameters, Key Performance Indicator and Self Optimization Networks.

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PROGRAM AGENDA
4G LTE RF Planning, Drivetest & Optimization

Day	Training Module	Syllabus	Objectives
Day 1 **Trainer :** **Lingga Wardhana** **&** **Alfin Hikmaturokman, ST., MT**	**Session 1 :** **LTE Radio Cellular Technology** **Session 2 :** **OFDMA &** **SC-FDMA** **Practice Session 1 :** **Data Preparation for LTE Design** **Practice Session 2 :** **Modelling an LTE Network**	08.00-09.00 : • *Opening* • **Pre-Test** • *Participant Introduction* 09.00-10.00 : • *LTE Radio Cellular Technology* • *LTE Network Architecture and Interconnection* • *LTE Cellular Frequency Allocation* 10.00-10.15 (Coffee Break) 10.15-12.00 : • *OFDM and OFDMA* • *LTE Spectrum Flexibility* • *LTE Frame Structure type 1 (FDD), downlink* • *LTE Frame Structure type 2 (TDD)* • *SC-FDMA* • *MIMO Antenna* • **Quiz** 12.00-13.00 (Lunch) *Quiz* 12.00-13.00 (Lunch) 13.00-14.00 : • *Import of heights map* • *Import of clutter map* • *Import of vector map* • *Setting a coordinate system* • *Network data setting* • *Import of the Sites table* 14.00 -15.00 : • *Antenna parameters setting* • *Transmitters parameters setting* • *Cells parameters setting* • *MIMO Settings* • *ICIC Settings* • *Smart Antenna Settings* • *Propagation model* • *SPM propagation model* • *Set the propagation model for each transmitter* • *Automatic calibration of the Cost-Hata model* • *Set the propagation*	1. Participants were able to define the difference between 2G, 3G and 4G. 2. Participants understand the network architecture in 4G LTE and interconnection with their legacy networks. 3. Participants understand the concept of OFDMA and SC-FDMA. 4. Participants were able to perform network modeling LTE (Antenna parameters, parameters Transmitters, Cell parameters, MIMO Settings, Settings ICIC). 5. Participants are able to create and calibrate propagation models for LTE networks

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| | Practice Session 3 : LTE Predictions | model for each transmitter
15.00-15.15 (Coffee Break)
15.50 -16.00 :
• *Setting the Computation Zone*
• *Propagation and prediction studies calculation*
• *Best server prediction*
• *Coverage by Signal Level prediction*
• *Overlapping Zones prediction*
16.00-17.00 :
• *Automatic Neighbours Allocation*
• *Automatically Allocation Feature*
• *Automatic Frequency Allocation*
• *Automatic PCI Allocation* | |
| | **Practice Session 4 : Neighbour, Frequency & Physical Cell ID Allocation** | | |

Day	Training Module	Syllabus	Objectives
Day 2 **Trainer : Alfin Hikmaturokman, ST., MT**	**Session 1 : LTE Drive test Basic knowledge** **Session 2 : LTE Drive test step & Procedure** **Practice Session 1 : LTE Drive test on field** **Practice Session 2 : LTE Drive test reporting**	08.00-08.30 : • *Session Review* 08.30-10.00 : • *Drive test Tools Introduction* • *Onsite hardware Introduction* • *LTE Drive test RF Parameter* 10.00-10.15 (Coffee Break) 10.15-12.00 : • *Accessibility test* • *Retainability test* • *Throughput test* • *Test plan creation* • *Important thing To DT Effective and Efficient* 12.00-13.00 (Lunch) 13.00-15.00 : • *Single site verification test* • *Cluster drive test* 15.00-15.30 (Coffee Break) 15.30 -16.30 : • *Single site Reporting* • *Cluster drive test Reporting*	1. Participants understand Drivetest measurement and analysis of the LTE network coverage. 2. Participants able to conduct LTE Drivetest both on Single site verification test and also cluster drive test. 3. Participants able to create final report for Single site reporting and cluster drive test Reporting.

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Day 3 – Day 7	On JOB Mentoring & Preparing Drivetest Study Case Report

Day	Training Module	Syllabus	Objectives
Day 8 **Trainer :** **Lingga Wardhana** **&** **Ray Khastur**	**Practice Session 1 :** **Drivetest Study Case Presentation & Knowledge Sharing**		Participants able to present Drivetest Problem, Root Cause Analysis and Action plan for problem solving

Day	Training Module	Syllabus	Objectives
Day 9 **Trainer :** **Ray Khastur**	**Session 1 :** **RF Configuration Parameters** **Session 2 :** **RF Operational Parameters** **Session 3 :** **Drivetest and Coverage Analysis** **Session 4 :** **OSS KPI in LTE Network** **Session 5 : LTE Feature Performance**	09.00-10.00 : • *PCI Planning* • *PRACH Planning* 10.00-10.15 (Coffee Break) 10.15-12.00 : • *Cell Search Parameter* • *Handover in LTE networks* • *Power Control Overview* 12.00-13.00 (Lunch) 13.00-14.00 : • *TD-LTE & FD-LTE* • *Reference Signal Received Power (RSRP)* • *Signal to Noise & Interference Ratio (SINR)* 14.00 -15.00 : • *Accessibility* • *Retainability* • *Mobility* 15.00-15.30 (Coffee Break) 15.30 -16.30 : • *Beamforming* • *IRC* • *Comparison Static ICIC and Dynamic ICIC* • *Self Optimization Network : AMR* • *Self Optimization Network : CSFB*	1. Participants understand the configuration of RF parameters on LTE network. 2. Participants understand Key Performance Indicators on LTE network. 3. Participants understand the features LTE network

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