

# LTE RF Optimization: Part 2– Downlink and Uplink Throughput

Instructor Led | Duration: 1.5 Days | Course Number: LTE\_422

This workshop provides insights into the symptoms and possible causes of field performance issues in LTE radio networks using UE logs. RF measurements related to coverage and interference are discussed to analyze coverage holes and overlapping regions. Students analyze LTE signaling messages through UE logs and map them to success and failure events. Students perform root cause analysis and gain an in-depth understanding of these signaling events to network performance. LTE RF optimization areas such as downlink and uplink throughput analysis are addressed. This knowledge transfer is obtained through hands-on experience using UE based diagnostic tools and scanner tools.

## Intended Audience

This workshop is primarily intended for RF and systems performance engineers involved in LTE design, performance, and optimization.

## Learning Objectives

After completing this workshop, the student will be able to:

- Define the LTE RF KPIs and map them to RAN counters
- Identify various LTE signaling events that map to success and failure operational counters
- Identify the RF measurements that are key to coverage and interference and analyze them through post processing tools
- Analyze UE logs for root cause analysis of successful and failure events and map these events to operational counters and corresponding KPIs
  - Understand LTE KPIs where they are pegged
  - Describe DL and UL bandwidth and UE throughput
  - Downlink and Uplink throughput issues

## Required Equipment

- PC laptop

## Suggested Prerequisites

- Exploring LTE (series of self-paced eLearning from Award Solutions)
- LTE RF Optimization: Part 1 – Coverage and Accessibility (Instructor Led)

## Special Note

*This is an advanced level course. Please **DO NOT** register for this course if you are not very familiar with LTE RAN Signaling.*

## Workshop Outline

### 1. Workshop Overview

### 2. LTE RAN KPIs

- 2.1. LTE RAN KPIs
- 2.2. LTE signaling to KPI mapping
- 2.3. Summary
- 2.4. Review exercise

### 3. DL Data Traffic Performance

- 3.1. DL traffic operation walk-through
- 3.2. DL traffic KPIs
- 3.3. Analysis of CQI, PMI, RI
- 3.4. HARQ/ARQ and BLER analysis
- 3.5. Summary
- 3.6. Review exercises

### 4. UL Data Traffic Performance

- 4.1. UL traffic operation walk-through
- 4.2. UL traffic KPIs
- 4.3. UL power control parameters
- 4.4. HARQ/ARQ and BLER analysis
- 4.5. Summary
- 4.6. Review exercises