



Customer Training Catalog Training Programs LTE Product Technical Training



HUAWEI
HUAWEI Learning Service
2015



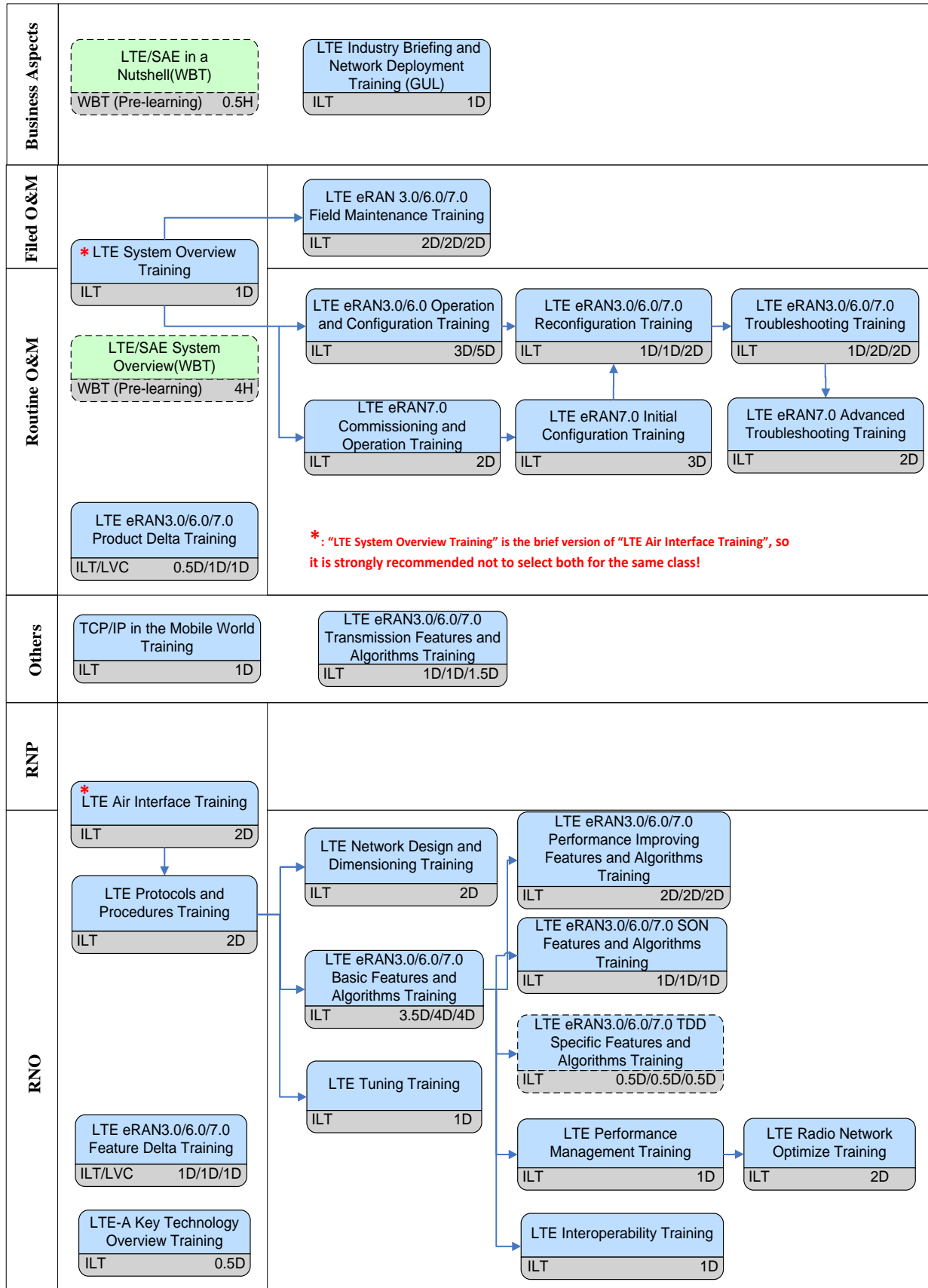
CONTENTS

- 1 Training Path..... 4
- 2 Training Programs 5
 - 2.1 Principle Training Programs 8
 - 2.1.1 LTE Industry Briefing and Network Deployment Training(GUL) 8
 - 2.1.2 LTE System Overview Training 9
 - 2.1.3 LTE Air Interface Training..... 10
 - 2.1.4 LTE Protocols and Procedures Training..... 11
 - 2.1.5 LTE-A Key Technology Overview Training 12
 - 2.1.6 TCP/IP in the Mobile World Training 13
 - 2.2 RNO Training Programs 14
 - 2.2.1 LTE eRAN3.0 Feature Delta Training..... 15
 - 2.2.2 LTE eRAN3.0 Basic Features and Algorithms Training..... 16
 - 2.2.3 LTE eRAN3.0 SON Features and Algorithms Training..... 17
 - 2.2.4 LTE eRAN3.0 TDD Specific Features and Algorithms Training 18
 - 2.2.5 LTE eRAN3.0 Performance Improving Features and Algorithms Training 19
 - 2.2.6 LTE eRAN6.0 Feature Delta Training..... 20
 - 2.2.7 LTE eRAN6.0 Basic Features and Algorithms Training..... 21
 - 2.2.8 LTE eRAN6.0 SON Features and Algorithms Training..... 22
 - 2.2.9 LTE eRAN6.0 TDD Specific Features and Algorithms Training..... 23
 - 2.2.10 LTE eRAN6.0 Performance Improving Features and Algorithms Training 24
 - 2.2.11 LTE eRAN7.0 Feature Delta Training..... 25
 - 2.2.12 LTE eRAN7.0 Basic Features and Algorithms Training..... 26
 - 2.2.13 LTE eRAN7.0 SON Features and Algorithms Training..... 27
 - 2.2.14 LTE eRAN7.0 TDD Specific Features and Algorithms Training..... 28
 - 2.2.15 LTE eRAN7.0 Performance Improving Features and Algorithms Training 29
 - 2.2.16 LTE Tuning Training 30
 - 2.2.17 LTE Performance Management Training 31
 - 2.2.18 LTE Radio Network Optimize Training 32
 - 2.2.19 LTE Interoperability Training 33
 - 2.3 RNP Training Programs 34
 - 2.3.1 LTE Network Design and Dimensioning Training 34
 - 2.4 Product Training Programs..... 36
 - 2.4.1 LTE eRAN3.0 Field Maintenance Training 36
 - 2.4.2 LTE eRAN3.0 Operation and Configuration Training 37
 - 2.4.3 LTE eRAN3.0 Reconfiguration Training 39
 - 2.4.4 LTE eRAN3.0 Troubleshooting Training..... 40
 - 2.4.5 LTE eRAN3.0 Product Delta Training..... 41
 - 2.4.6 LTE eRAN3.0 Transmission Features and Algorithms Training 42
 - 2.4.7 LTE eRAN6.0 Field Maintenance Training 43
 - 2.4.8 LTE eRAN6.0 Operation and Configuration Training 44



- 2.4.9 LTE eRAN6.0 Reconfiguration Training 46
- 2.4.10 LTE eRAN6.0 Troubleshooting Training..... 47
- 2.4.11 LTE eRAN6.0 Product Delta Training..... 48
- 2.4.12 LTE eRAN6.0 Transmission Features and Algorithms Training 49
- 2.4.13 LTE eRAN7.0 Field Maintenance Training 50
- 2.4.14 LTE eRAN7.0 Commissioning and Operation Training 51
- 2.4.15 LTE eRAN7.0 Initial Configuration Training..... 52
- 2.4.16 LTE eRAN7.0 Reconfiguration Training 53
- 2.4.17 LTE eRAN7.0 Troubleshooting Training..... 54
- 2.4.18 LTE eRAN7.0 Advanced Troubleshooting Training 55
- 2.4.19 LTE eRAN7.0 Product Delta Training..... 56
- 2.4.20 LTE eRAN7.0 Transmission Features and Algorithms Training 57
- 2.5 WBT 58
 - 2.5.1 LTE SAE System Overview(WBT) 58
 - 2.5.2 LTE in a Nutshell (WBT) 59

1 Training Path



2 Training Programs

LTE Product Technical Training Training Programs are designed as follows:

Training Program	Program Level	Duration (workdays)	Training Location	Class Size
Principle				
LTE Industry Briefing and Network Deployment Training(GUL)	II	1		6 ~ 12
LTE System Overview Training	I	1		6 ~ 12
LTE Air Interface Training	II	2		6 ~ 12
LTE Protocol and Procedure Training	II	2		6 ~ 12
LTE-A Key Technology Overview Training	II	0.5		6 ~ 12
TCP/IP in the Mobile World Training	II	1		6 ~ 12
Product				
LTE eRAN3.0 Field Maintenance Training	I	2		6 ~ 12
LTE eRAN3.0 Operation and Configuration Training	II	3		6 ~ 12
LTE eRAN3.0 Reconfiguration Training	II	1		6 ~ 12
LTE eRAN3.0 Troubleshooting Training	II	1		6 ~ 12
LTE eRAN3.0 Product Delta Training	III	1		6 ~ 12
LTE eRAN3.0 Transmission Features and Algorithms Training	III	1		6 ~ 12
LTE eRAN6.0 Field Maintenance Training	I	2		6 ~ 12
LTE eRAN6.0 Operation and Configuration Training	II	5		6 ~ 12
LTE eRAN6.0 Reconfiguration Training	II	1		6 ~ 12
LTE eRAN6.0 Troubleshooting Training	II	2		6 ~ 12
LTE eRAN6.0 Product Delta Training	III	1		6 ~ 12
LTE eRAN6.0 Transmission Features and Algorithms Training	III	1		6 ~ 12
LTE eRAN7.0 Field Maintenance Training	I	2		6 ~ 12
LTE eRAN7.0 Commissioning and Operation Training	II	2		6 ~ 12
LTE eRAN7.0 Initial Configuration Training	II	3		6 ~ 12

LTE eRAN7.0 Reconfiguration Training	II	2		6 ~ 12
LTE eRAN7.0 Troubleshooting Training	II	2		6 ~ 12
LTE eRAN7.0 Advanced Troubleshooting Training	III	2		6 ~ 12
LTE eRAN7.0 Product Delta Training	III	1		6 ~ 12
LTE eRAN7.0 Transmission Features and Algorithms Training	III	1.5		6 ~ 12
RNP				
LTE Network Design and Dimensioning Training	III	2		6 ~ 12
RNO				
LTE eRAN3.0 Feature Delta Training	III	1		6 ~ 12
LTE eRAN3.0 Basic Features and Algorithms Training	III	3.5		6 ~ 12
LTE eRAN3.0 SON Features and Algorithms Training	III	1		6 ~ 12
LTE eRAN3.0 TDD Specific Features and Algorithms Training	III	0.5		6 ~ 12
LTE eRAN3.0 Performance Improving Features and Algorithms Training	III	2		6 ~ 12
LTE eRAN6.0 Feature Delta Training	III	1		6 ~ 12
LTE eRAN6.0 Basic Features and Algorithms Training	III	4		6 ~ 12
LTE eRAN6.0 SON Features and Algorithms Training	III	1		6 ~ 12
LTE eRAN6.0 TDD Specific Features and Algorithms Training	III	0.5		6 ~ 12
LTE eRAN6.0 Performance Improving Features and Algorithms Training	III	2		6 ~ 12
LTE eRAN7.0 Feature Delta Training	III	1		6 ~ 12
LTE eRAN7.0 Basic Features and Algorithms Training	III	4		6 ~ 12
LTE eRAN7.0 SON Features and Algorithms Training	III	1		6 ~ 12
LTE eRAN7.0 TDD Specific Features and Algorithms Training	III	0.5		6 ~ 12
LTE eRAN7.0 Performance Improving Features and Algorithms Training	III	2		6 ~ 12
LTE Tuning Training	III	1		6 ~ 12
LTE Performance Management Training	III	1		6 ~ 12
LTE Radio Network Optimize Training	IV	2		6 ~ 12
LTE Interoperability Training	IV	1		6 ~ 12

WBT				
LTE SAE System Overview	I	4H		
LTE in a Nutshell	I	0.5H		

Level Description: I : Basic Course II : Intermediate Course III: Advanced Course IV: Expert Course

2.1 Principle Training Programs

2.1.1 LTE Industry Briefing and Network Deployment Training(GUL)

Training Path

LTE Industry Briefing and Network Deployment (GUL)		
OEA11	Lecture	1d

- Describe various services and trends provided by LTE
- Overview evolution of radio technologies
- Describe network architecture of EPS(E-UTRAN and EPC)
- Explain key technologies of LTE, such as OFDM/SC-FDM, MIMO
- Brief LTE industry chain development
- Outline LTE overall network evolution deployment scenario such as interoperability strategy, voice strategy etc.

Target Audience

Business Developer

Prerequisites

- A general knowledge in cellular systems and radio technology

Objectives

On completion of this program, the participants will be able to:

- Outline Incentive of LTE

Duration

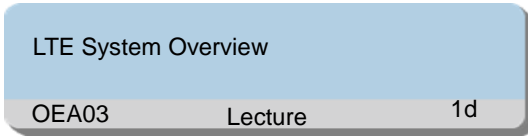
1 working day

Class Size

Min 6, Max 12

2.1.2 LTE System Overview Training

Training Path



Target Audience

Field Technician
Service Technician
System Technician
Network Deployment Engineer
Service Engineer
Service Design Engineer
Service Planning Engineer
System Engineer

Prerequisites

A general knowledge in cellular systems and radio technology

Objectives

On completion of this program, the participants will be able to:

- Describe the evolution of cellular networks
- Summarize the evolution of 3GPP releases
- Explain the logical architecture of EPS (E-UTRAN and EPC)
- Give an overview of the interfaces in EPS
- Describe the Evolved Packet Core (EPC)

- Describe the role of the MME and the S-GW
- Describe the S1, X2 and radio-interface and their protocol stacks
- Describe the radio interface techniques used in uplink and downlink
- Describe the channel structure of the radio interface
- Describe the time-domain and Frequency-domain structure in the radio interface in UL and DL for both FDD and TDD mode
- Have a good understanding of the OFDM principle, signal generation and processing
- Detail the reference symbols in DL
- Describe MIMO technology
- Have a good understanding of the SC-FDMA principle, signal generation and processing
- Describe Huawei eNodeB Family
- Describe Huawei LTE products and application scenarios
- Describe Huawei LTE products Operation and Maintenance System

Duration

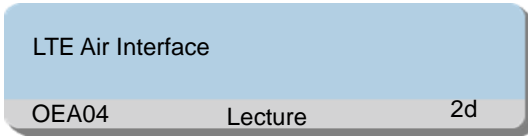
1 working day

Class Size

Min 6, Max 12

2.1.3 LTE Air Interface Training

Training Path



Target Audience

Service Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

Attendees should have a general knowledge in cellular systems and radio technology.

Objectives

On completion of this program, the participants will be able to:

- Describe the evolution of cellular networks
- Summarize the evolution of 3GPP releases
- Describe the radio interface techniques
- Explain the difference between the FDD and TDD mode
- Describe the flexible spectrum usage
- Outline the concepts of channel coding
- Describe the principle for OFDM
- Have a good understanding of the OFDMA/SC-FDMA principle, signal generation and processing
- Explain the pros and cons with OFDMA and SC-FDMA

- Outline the radio interface protocols
- Detail the time-domain and frequency-domain structure in the radio interface in UL and DL for both FDD and TDD mode
- Detail the channel structure of the radio interface
- Detail the frame structure of the radio interface
- Describe the uplink/downlink physical signals
- Detail the uplink/downlink control signaling and formats
- Detail the uplink/downlink reference symbols
- Detail the uplink/downlink transmission technique
- Detail the paging procedures
- Explain the cell search procedure
- Detail the random access procedure
- Describe the uplink/downlink power control
- Explain HARQ
- Describe the concepts of layers, channel rank, spatial multiplexing, open and closed loop spatial multiplexing, TX diversity, beamforming, SU-MIMO and MU-MIMO
-

Duration

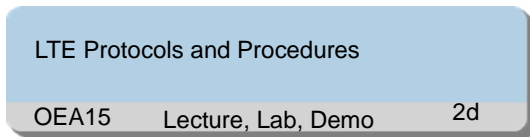
2 working days

Class Size

Min 6, Max 12

2.1.4 LTE Protocols and Procedures Training

Training Path



Target Audience

Service Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

Successful completion of the following courses::
LTE Air Interface

Objectives

On completion of this program, the participants will be able to:

- Describe the evolution of cellular networks
- Explain the main functions of EPS network element
- List the interfaces in EPS and the protocol of

EPS interfaces

- Explain how signaling takes place between the UE and the EPC
- Brief the main functions of Non Access Stratum(NAS), Radio Resource Control (RRC), Packet Data Convergence Protocol (PDCP) Radio Link Control (RLC), Medium Access Control (MAC), the physical layer and their relations
- Explain the purpose of EPS Bearer Services and eUTRA Radio Bearer

Explain the concept, principle and signaling flow of typical procedure, such as UE access procedure, paging, TAU, handover etc.

Duration

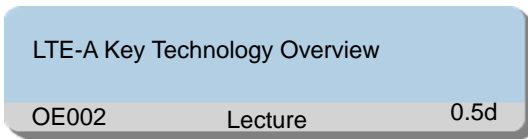
2 working days

Class Size

Min 6, Max 12

2.1.5 LTE-A Key Technology Overview Training

Training Path



Target Audience

Service Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

Successful completion of the following courses:
LTE System Overview
LTE Air Interface
LTE eRAN3.0 Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Describe LTE Describe -A requirements and 3GPP schedule
- Describe benefit and principle of LTE-A key technology
- Huawei LTE-A cases study

Duration

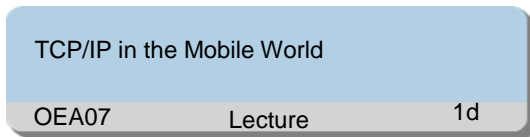
0.5 working day

Class Size

Min 6, Max 12

2.1.6 TCP/IP in the Mobile World Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

A general knowledge in cellular systems and radio technology

Objectives

On completion of this program, the participants will be able to:

- Learn about IP protocol release specifications and common RFC standards

- Learn about common IP RAN concepts such as the MSTP and PTN
- Understand the TCP/IP protocol structure, and learn common technologies such as the VLAN and DSCP
- Learn the protocol stack composition on IP RAN interfaces
- Learn the IP components, and understand the data exchange process
- Be familiar with common IP RAN devices and maintenance applications
- Learn about differences among the IP, ATM, and TDM technologies, and problems caused by IP-based networking

Duration

1 working day

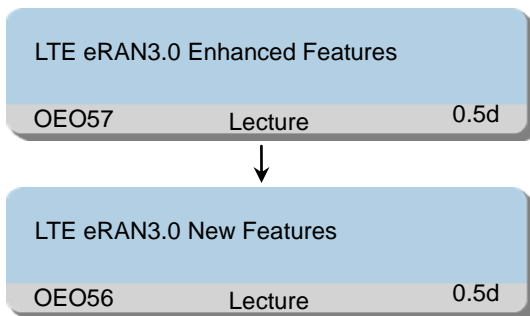
Class Size

Min 6, Max 12

2.2 RNO Training Programs

2.2.1 LTE eRAN3.0 Feature Delta Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

Successful completion of the following courses:
LTE Air Interface
LTE Protocols and Procedures

LTE eRAN2.1/2.2 Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Describe enhanced and new functions in Handover Feature from eRAN2.1/2.2 to eRAN3.0
- Introduce enhanced functions in RAN Sharing(Optional)
- Outline new functions in CSFB Feature in eRAN3.0
- Explain UL CoMP Feature in eRAN3.0
- Describe 800M self-interference cancellation in eRAN3.0(Optional)

Duration

1 working day

Class Size

Min 6, Max 12

2.2.2 LTE eRAN3.0 Basic Features and Algorithms Training

Training Path

LTE eRAN3.0 Basic Features and Algorithms

OEO51

Lecture

3.5d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

Successful completion of the following courses:
LTE Air Interface
LTE Protocols and Procedures

Objectives

On completion of this program, the participants will be able to:

- Outline idle mode
- Describe PLMN selection
- Describe cell selection and cell reselection
- Config cell selection
- Config cell reselection measurement
- Describe system information reception
- Config SIB
- Describe tracking area registration
- Describe paging monitoring procedure
- Outline mobility management
- Describe intra-frequency handover
- Describe inter-frequency handover
- Describe inter-rat handover
- Set measurement configuration
- Set handover related parameters
- Outline power control

- Describe downlink power control
- Describe uplink power control
- Set initial power
- Outline scheduling
- Describe downlink scheduling
- Describe uplink scheduling
- Describe scheduling deployment strategy
- Describe basic principles of QoS management
- Describe QoS management policies
- Describe QoS management methods
- List when to use QoS management
- Outline MIMO feature
- Describe multiple-antenna reception/transmission MIMO
- Describe multiple-antenna transmission MIMO
- Describe adaptive mode selection and switching of MIMO
- Set adaptive MIMO
- Describe PDCCH/PUCCH resource management feature
- parameters
- Outline LTE voice solutions
- Outline CS Fallback
- Describe CS Fallback procedure
- Draw network architecture for CS Fallback to UTRAN/GERAN
- Describe CS Fallback to UTRAN/GERAN
- Select CS Fallback mechanisms
- Perform configuration on eNodeB for CS Fallback

Duration

3.5 working days

Class Size

Min 6, Max 12

2.2.3 LTE eRAN3.0 SON Features and Algorithms Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

Successful completion of the following courses:
LTE Air Interface
LTE Protocols and Procedures
LTE eRAN3.0 Basic Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Outline ANR overview
- Describe intra-RAT ANR management
- Describe inter-RAT ANR management
- Switch on ANR
- Set ANR related parameters
- Outline MRO processing flow
- List classification of intra-RAT MRO

- Describe intra-RAT MRO management
- Describe inter-RAT MRO management
- Set MRO to optimize handover
- Outline PCI conflict detection
- self-optimization overview
- Describe PCI conflict detection
- Describe PCI self-optimization in M2000
- Observe PCI conflict information
- Set PCI conflict detection
- Outline RACH optimization
- Describe prerequisites for RACH optimization
- Describe zero correlation zone configuration
- Describe contention-based vs. contention-free random access
- Describe RACH resource adjustment
- Perform MML to deploy RACH optimization
- Describe impact of RACH optimization
- Outline cell outage detection
- Describe sleeping cell detection techniques
- Describe cell outage detection techniques
- Deploy cell outage detection

Duration

1 working day

Class Size

Min 6, Max 12

2.2.4 LTE eRAN3.0 TDD Specific Features and Algorithms Training

Training Path

LTE eRAN3.0 TDD Specific Features and Algorithms		
OEO53	Lecture	0.5d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

Successful completion of the following courses:
LTE Air Interface
LTE Protocols and Procedures
LTE eRAN3.0 Basic Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Outline beamforming
- Describe beamforming-related concepts
- Describe beamforming principles and techniques
- Describe beamforming feature application scenarios
- Deploy beamforming
- Describe concept of sector, cell and TDD subframe configuration
- Draw TDD frame structure
- Describe uplink-downlink subframe configurations
- Describe configurations of special subframes
- Describe when to use subframe configuration
- Perform subframe configuration

Duration

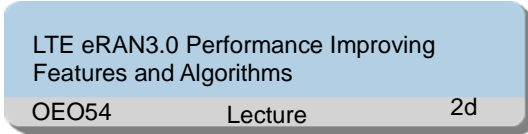
0.5 working day

Class Size

Min 6, Max 12

2.2.5 LTE eRAN3.0 Performance Improving Features and Algorithms Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

Successful completion of the following courses:

LTE Air Interface
LTE Protocols and Procedures
LTE eRAN3.0 Basic Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Describe admission control
- Set admission control
- Describe congestion control
- Outline load monitoring
- Outline load balance
- Describe intra - frequency load balance

- Describe inter-frequency load balance
- Describe inter-RAT load balance
- Outline compact bandwidth
- Describe key technologies of compact bandwidth
- Describe related physical resource management
- Deploy compact bandwidth
- Outline UL CoMP
- Describe application scenarios of UL CoMP
- Describe key techniques for UL CoMP
- Describe related features of UL CoMP
- Deploy UL CoMP
- Outline ICIC
- Describe downlink ICIC
- Describe uplink ICIC
- Describe ICIC deployment strategy
- Deploy ICIC
- Outline principle and algorithm of RAN Sharing(Optional)

Duration

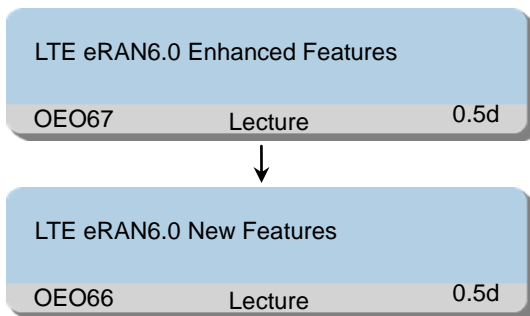
2 working days

Class Size

Min 6, Max 12

2.2.6 LTE eRAN6.0 Feature Delta Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

Successful completion of the following courses:
LTE Air Interface
LTE Protocols and Procedures

LTE eRAN3.0 Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Describe enhanced functions in Handover Feature from eRAN3.0 to eRAN6.0
- Describe enhanced and new functions in CS Fallback from eRAN3.0 to eRAN6.0
- Describe enhanced functions in Cell Outage Detection from eRAN3.0 to eRAN6.0
- Describe new functions in DRX and Signaling Control from eRAN3.0 to eRAN6.0
- Describe new features in eRAN6.0

Duration

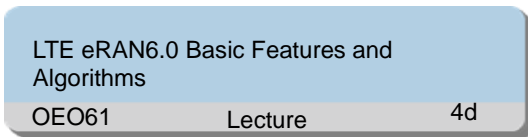
1 working day

Class Size

Min 6, Max 12

2.2.7 LTE eRAN6.0 Basic Features and Algorithms Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

Successful completion of the following courses:
LTE Air Interface
LTE Protocols and Procedures

Objectives

On completion of this program, the participants will be able to:

- Outline idle mode
- Describe PLMN selection
- Describe cell selection and cell reselection
- Config cell selection
- Config cell reselection measurement
- Describe system information reception
- Config SIB
- Describe tracking area registration
- Describe paging monitoring procedure
- Outline mobility management
- Describe intra-frequency handover
- Describe inter-frequency handover
- Describe inter-rat handover
- Set measurement configuration
- Set handover related parameters
- Outline power control
- Describe downlink power control
- Describe uplink power control
- Set initial power

- Outline scheduling
- Describe downlink scheduling
- Describe uplink scheduling
- Describe scheduling deployment strategy
- Describe basic principles of QoS management
- Describe QoS management policies
- Describe QoS management methods
- List when to use QoS management
- Outline MIMO feature
- Describe multiple-antenna reception/transmission MIMO
- Describe multiple-antenna transmission MIMO
- Describe adaptive mode selection and switching of MIMO
- Set adaptive MIMO
- Describe PDCCH/PUCCH resource management feature
- parameters
- Outline CS Fallback
- Describe CS Fallback procedure
- Draw network architecture for CS Fallback to UTRAN/GERAN
- Describe CS Fallback to UTRAN/GERAN
- Select CS Fallback mechanisms
- Perform configuration on eNodeB for CS Fallback
- Outline CA Basic Concepts and Principles
- Describe CA Feature Benefit and Influence
- Perform CA Feature Deployment and Configuration
- Outline DRX basic concepts
- Describe DRX realization principles

Duration

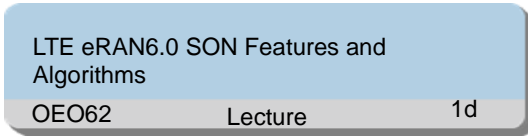
4 working days

Class Size

Min 6, Max 12

2.2.8 LTE eRAN6.0 SON Features and Algorithms Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

Successful completion of the following courses:

LTE Air Interface
LTE Protocols and Procedures
LTE eRAN6.0 Basic Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Outline ANR overview
- Describe intra-RAT ANR management
- Describe inter-RAT ANR management
- Switch on ANR
- Set ANR related parameters
- Outline MRO processing flow
- List classification of intra-RAT MRO

- Describe intra-RAT MRO management
- Describe inter-RAT MRO management
- Set MRO to optimize handover
- Outline PCI conflict detection
- self-optimization overview
- Describe PCI conflict detection
- Describe PCI self-optimization in M2000
- Observe PCI conflict information
- Set PCI conflict detection
- Outline RACH optimization
- Describe prerequisites for RACH optimization
- Describe zero correlation zone configuration
- Describe contention-based vs. contention-free random access
- Describe RACH resource adjustment
- Perform MML to deploy RACH optimization
- Describe impact of RACH optimization
- Outline cell outage detection
- Describe sleeping cell detection techniques
- Describe cell outage detection techniques
- Deploy cell outage detection

Duration

1 working day

Class Size

Min 6, Max 12

2.2.9 LTE eRAN6.0 TDD Specific Features and Algorithms Training

Training Path

LTE eRAN6.0 TDD Specific Features and Algorithms		
OEO63	Lecture	0.5d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

Successful completion of the following courses:
LTE Air Interface
LTE Protocols and Procedures
LTE eRAN6.0 Basic Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Outline beamforming
- Describe beamforming-related concepts
- Describe beamforming principles and techniques
- Describe beamforming feature application scenarios
- Deploy beamforming
- Describe concept of sector, cell and TDD subframe configuration
- Draw TDD frame structure
- Describe uplink-downlink subframe configurations
- Describe configurations of special subframes
- Describe when to use subframe configuration
- Perform subframe configuration

Duration

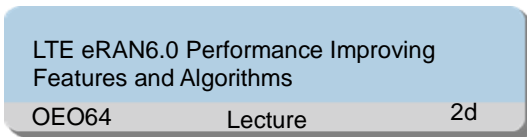
0.5 working day

Class Size

Min 6, Max 12

2.2.10 LTE eRAN6.0 Performance Improving Features and Algorithms Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

Successful completion of the following courses:

LTE Air Interface
LTE Protocols and Procedures
LTE eRAN6.0 Basic Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Describe admission control
- Set admission control
- Describe congestion control
- Outline load monitoring
- Outline load balance
- Describe intra - frequency load balance

- Describe inter-frequency load balance
- Describe inter-RAT load balance
- Outline compact bandwidth
- Describe key technologies of compact bandwidth
- Describe related physical resource management
- Deploy compact bandwidth
- Outline UL CoMP
- Describe application scenarios of UL CoMP
- Describe key techniques for UL CoMP
- Describe related features of UL CoMP
- Deploy UL CoMP
- Outline ICIC
- Describe downlink ICIC
- Describe uplink ICIC
- Describe ICIC deployment strategy
- Deploy ICIC
- Outline principle and algorithm of RAN Sharing(Optional)

Duration

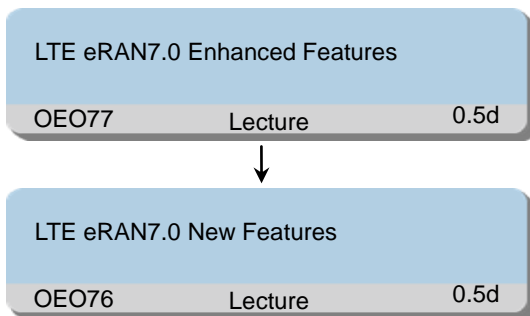
2 working days

Class Size

Min 6, Max 12

2.2.11 LTE eRAN7.0 Feature Delta Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

Successful completion of the following courses:
LTE Air Interface

LTE Protocols and Procedures

LTE eRAN3.0 Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Describe enhanced functions in Handover Feature from eRAN6.0 to eRAN7.0
- Describe enhanced and new functions in scheduling from eRAN6.0 to eRAN7.0
- Describe enhanced functions in MLB from eRAN6.0 to eRAN7.0
- Describe new features in eRAN6.0

Duration

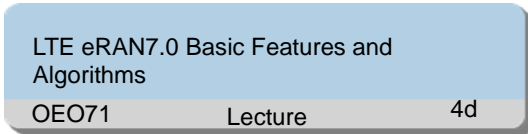
1 working day

Class Size

Min 6, Max 12

2.2.12 LTE eRAN7.0 Basic Features and Algorithms Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

Successful completion of the following courses:
LTE Air Interface
LTE Protocols and Procedures

Objectives

On completion of this program, the participants will be able to:

- Outline idle mode
- Describe PLMN selection
- Describe cell selection and cell reselection
- Config cell selection
- Config cell reselection measurement
- Describe system information reception
- Config SIB
- Describe tracking area registration
- Describe paging monitoring procedure
- Outline mobility management
- Describe intra-frequency handover
- Describe inter-frequency handover
- Describe inter-rat handover
- Set measurement configuration
- Set handover related parameters
- Outline power control
- Describe downlink power control
- Describe uplink power control
- Set initial power

- Outline scheduling
- Describe downlink scheduling
- Describe uplink scheduling
- Describe scheduling deployment strategy
- Describe basic principles of QoS management
- Describe QoS management policies
- Describe QoS management methods
- List when to use QoS management
- Outline MIMO feature
- Describe multiple-antenna reception/transmission MIMO
- Describe multiple-antenna transmission MIMO
- Describe adaptive mode selection and switching of MIMO
- Set adaptive MIMO
- Describe PDCCH/PUCCH resource management feature
- parameters
- Outline CS Fallback
- Describe CS Fallback procedure
- Draw network architecture for CS Fallback to UTRAN/GERAN
- Describe CS Fallback to UTRAN/GERAN
- Select CS Fallback mechanisms
- Perform configuration on eNodeB for CS Fallback
- Outline CA Basic Concepts and Principles
- Describe CA Feature Benefit and Influence
- Perform CA Feature Deployment and Configuration
- Outline DRX basic concepts
- Describe DRX realization principles

Duration

4 working days

Class Size

Min 6, Max 12

2.2.13 LTE eRAN7.0 SON Features and Algorithms Training

Training Path

LTE eRAN7.0 SON Features and Algorithms		
OEO72	Lecture	1d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

Successful completion of the following courses:

LTE Air Interface
LTE Protocols and Procedures
LTE eRAN7.0 Basic Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Outline ANR overview
- Describe intra-RAT ANR management
- Describe inter-RAT ANR management
- Switch on ANR
- Set ANR related parameters
- Outline MRO processing flow
- List classification of intra-RAT MRO

- Describe intra-RAT MRO management
- Describe inter-RAT MRO management
- Set MRO to optimize handover
- Outline PCI conflict detection
- self-optimization overview
- Describe PCI conflict detection
- Describe PCI self-optimization in M2000
- Observe PCI conflict information
- Set PCI conflict detection
- Outline RACH optimization
- Describe prerequisites for RACH optimization
- Describe zero correlation zone configuration
- Describe contention-based vs. contention-free random access
- Describe RACH resource adjustment
- Perform MML to deploy RACH optimization
- Describe impact of RACH optimization
- Outline cell outage detection
- Describe sleeping cell detection techniques
- Describe cell outage detection techniques
- Deploy cell outage detection

Duration

1 working day

Class Size

Min 6, Max 12

2.2.14 LTE eRAN7.0 TDD Specific Features and Algorithms Training

Training Path

LTE eRAN7.0 TDD Specific Features and Algorithms		
OEO73	Lecture	0.5d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

Successful completion of the following courses:
LTE Air Interface
LTE Protocols and Procedures
LTE eRAN7.0 Basic Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Outline beamforming
- Describe beamforming-related concepts
- Describe beamforming principles and techniques
- Describe beamforming feature application scenarios
- Deploy beamforming
- Describe concept of sector, cell and TDD subframe configuration
- Draw TDD frame structure
- Describe uplink-downlink subframe configurations
- Describe configurations of special subframes
- Describe when to use subframe configuration
- Perform subframe configuration

Duration

0.5 working day

Class Size

Min 6, Max 12

2.2.15 LTE eRAN7.0 Performance Improving Features and Algorithms Training

Training Path

LTE eRAN7.0 Performance Improving Features and Algorithms		
OEO74	Lecture	2d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

Successful completion of the following courses:

LTE Air Interface
LTE Protocols and Procedures
LTE eRAN7.0 Basic Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Describe admission control
- Set admission control
- Describe congestion control
- Outline load monitoring
- Outline load balance
- Describe intra - frequency load balance

- Describe inter-frequency load balance
- Describe inter-RAT load balance
- Outline compact bandwidth
- Describe key technologies of compact bandwidth
- Describe related physical resource management
- Deploy compact bandwidth
- Outline UL CoMP
- Describe application scenarios of UL CoMP
- Describe key techniques for UL CoMP
- Describe related features of UL CoMP
- Deploy UL CoMP
- Outline ICIC
- Describe downlink ICIC
- Describe uplink ICIC
- Describe ICIC deployment strategy
- Deploy ICIC
- Outline principle and algorithm of RAN Sharing(Optional)

Duration

2 working days

Class Size

Min 6, Max 12

2.2.16 LTE Tuning Training

Training Path

LTE Network Tuning		
OEO01	Lecture, Demo	1d

Target Audience

System Technician
Service Technician
System Engineer
Service Engineer

Prerequisites

Successful completion of the following courses:
LTE Air Interface
LTE Protocols and Procedures

Objectives

On completion of this program, the participants will be able to:

- Describe basic process of RF optimization

- Make test preparations
- Collect data collection for tuning
- List factors affecting coverage
- List solutions for weak coverage
- List solutions for cross coverage
- List solutions for lack of dominant cell
- Perform basic coverage problem analysis
- List main handover problems during network tuning
- Perform basic handover problem analysis
- Perform basic RF adjustment
- Familiar Huawei GENEX Probe & Assistant Operation

Duration

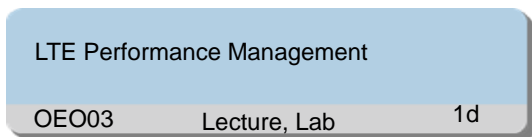
1 working day

Class Size

Min 6, Max 12

2.2.17 LTE Performance Management Training

Training Path



Target Audience

System Technician
Service Technician
System Engineer
Service Engineer

Prerequisites

Successful completion of the following courses:
LTE Air Interface
LTE Protocols and Procedures
LTE Basic Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Describe the structure of LTE performance measurement system
- List classification of KPI
- Describe accessibility KPI and detail the counters of it

- Describe retainability KPIs and detail the counters of them
- Describe mobility KPIs and detail the counters of them
- Describe service integrity
- Describe utilization KPIs and detail the counters of them
- Describe availability KPIs and detail the counters of them
- Describe traffic KPI and detail the counters of them
- Describe performance management basic concepts
- Describe measurement management
- Implement performance measurement operations on M2000
- Implement custom counter management
- Query performance result

Duration

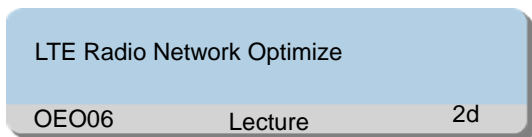
1 working day

Class Size

Min 6, Max 12

2.2.18 LTE Radio Network Optimize Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

Successful completion of the following courses:
LTE Air Interface
LTE Protocols and Procedures
LTE Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Outline handover procedure
- Perform handover fault analysis
- Describe typical case of handover fault

- Describe basic principle of access
- Describe fault diagnosis process
- Perform operations of fault diagnosis
- Perform checking hardware connections
- Perform checking version mapping
- Perform checking the eNodeB configuration
- Perform checking quality on the air interface
- Perform checking the EPC configuration
- Describe time and frequency resources and throughput calculation
- Describe throughput fault diagnosis procedures and methods
- Describe processes of data transmission fault diagnosis
- Describe basic requirements for fault diagnosis
- Perform diagnosis for locating downlink data transmission faults
- Perform diagnosis for uplink problems

Duration

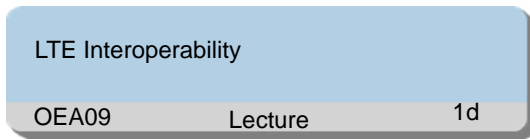
2 working days

Class Size

Min 6, Max 12

2.2.19 LTE Interoperability Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

Successful completion of the following courses:
LTE Air Interface
LTE Protocols and Procedures

Objectives

On completion of this program, the participants will

be able to:

- Outline challenges for LTE interoperability
- Describe GUL interoperability network architecture and interfaces
- Describe IRAT PLMN selection process, cell selection/selection process and signaling procedure in idle mode
- Describe IRAT measurement triggering/stopping phase, measurement phase, execution phase and signaling procedure in connection mode
- Application and realization of IRAT

Duration

0.5 working day

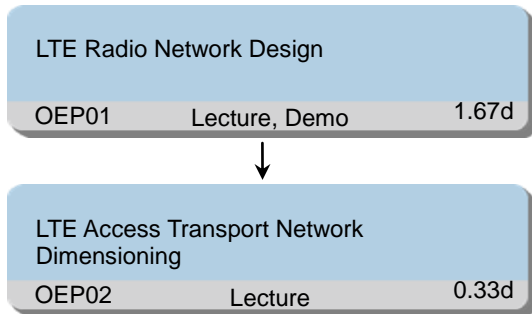
Class Size

Min 6, Max 12

2.3 RNP Training Programs

2.3.1 LTE Network Design and Dimensioning Training

Training Path



Target Audience

Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures

Objectives

On completion of this program, the participants will be able to:

- Outline LTE radio network planning
- Describe LTE radio network planning Process
- Describe differences between 2G/3G and LTE Dimensioning
- Perform LTE radio network coverage

dimensioning

- Perform LTE link budget
- Describe propagation model
- Perform site number dimensioning
- Outline capacity dimensioning procedure
- Describe traffic model and parameters
- Perform radio network throughput calculation
- Analysis DL Throughput
- Analysis UL Throughput
- Perform throughput per cell(IP) dimensioning
- Perform capacity dimensioning
- Outline frequency planning
- Outline TA planning
- Outline PCI planning
- Outline PRACH planning
- Describe the LTE transport networking
- Describe the S1 and X2 interface protocol
- Explain IP functionality, such as VLAN, IP sec etc.
- Perform transport network dimensioning
- Perform eNodeB hardware dimensioning

Duration

2 working days

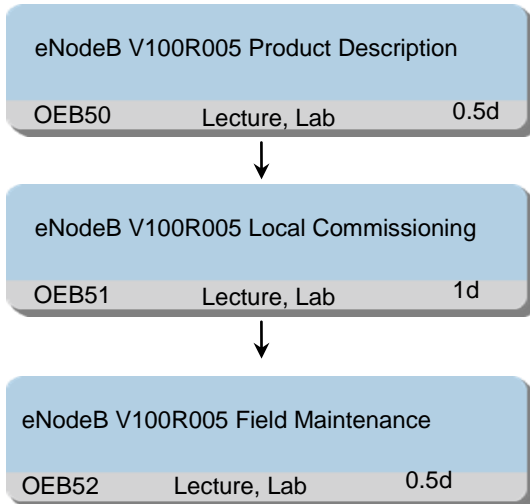
Class Size

Min 6, Max 12

2.4 Product Training Programs

2.4.1 LTE eRAN3.0 Field Maintenance Training

Training Path



Target Audience

Field Technician

System Technician

Network Deployment Engineer

Prerequisites

Successful completion of the following courses:

LTE System Overview

Objectives

On completion of this program, the participants will be able to:

- Describe the hardware structure of eNodeB
- Describe the logical structure of eNodeB
- Describe the working principle and functions of eNodeB boards
- Describe the procedure of eNodeB commissioning
- Describe the related concept of eNodeB software and configuration file
- Querying the current version of eNodeB
- Use USB disk to commission the eNodeB
- Commission the eNodeB through LMT
- Verify commissioning result
- Power up/down the eNodeB and connect up LMT to the node
- Find the alarm list of eNodeB
- Perform corrective and preventive maintenance on eNodeB
- Find faulty hardware units and replace them

Duration

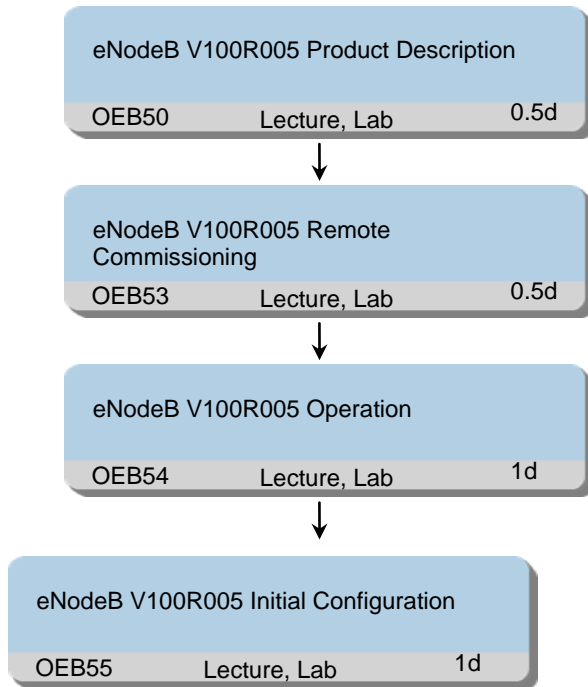
2 working days

Class Size

Min 6, Max 12

2.4.2 LTE eRAN3.0 Operation and Configuration Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

Successful completion of the following courses:
LTE System Overview

Objectives

On completion of this program, the participants will be able to:

- Describe the hardware structure of eNodeB
- Describe the logical structure of eNodeB
- Describe the working principle and functions of eNodeB boards
- Explain the architecture and components of eNodeB operation and maintenance system
- Install LMT software
- Install M2000 client software
- Use LMT login eNodeB

- Use M2000 client Login M2000 server and eNodeB
- Execute MML in single mode
- Execute MML in batch mode
- Manage alarms of eNodeB
- Manage device, such as querying board states, blocking board and unblocking board
- Manage software, such as querying current software version and backup configuration file
- Manage transport data, such as querying IP address of Ethernet port and querying IP route
- Manage radio data, such as querying cell states and querying neighbor cell
- Manage tracing message, for example: creating a tracing task, checking tracing result, saving result
- Manage real-time monitoring, for example: creating a monitoring task, checking and saving monitoring result
- Describe the procedure of eNodeB commissioning
- Describe the related concept of eNodeB software and configuration file
- Querying the current version of eNodeB
- Commission the eNodeB through M2000
- Verify commissioning result
- Outline the procedure of eNodeB data configuration
- Describe the main table of "eNodeB Summary Data"
- Use LTE Configuration System to create project
- Use LTE Configuration System to import external template
- Use LTE Configuration System to query data configuration and modify data
- Use LTE Configuration System to check up data
- Use LTE Configuration System to export data

Duration

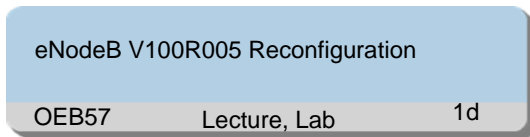
3 working days

Class Size

Min 6, Max 12

2.4.3 LTE eRAN3.0 Reconfiguration Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

Successful completion of the following courses:
LTE System Overview
eNodeB LTE V100R005 Product Description

Objectives

On completion of this program, the participants will be able to:

- Outline CME/MML operation
- Perform capacity expansion
- Perform adding an FDD cell
- Perform changing the cell bandwidth
- Perform adding an MME Connection
- Perform adding an S-GW Connection
- Perform network reconstruction
- Perform changing the cell EARFCNs
- Perform changing the Cell PCI
- Perform changing the Cell ID
- Perform relocating an MME
- Perform relocating an S-GW

Duration

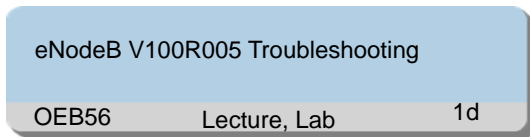
1 working day

Class Size

Min 6, Max 12

2.4.4 LTE eRAN3.0 Troubleshooting Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

Successful completion of the following courses:
LTE System Overview
eNodeB LTE V100R005 Product Description
eNodeB LTE V100R005 Reconfiguration

Objectives

On completion of this program, the participants will be able to:

- Outline the procedure of eNodeB troubleshooting flow
- Perform the alarm management and analysis
- Perform the log collection
- Draw hardware fault handling procedure
- Handle with the main faults of device level
- Draw transport fault handling procedure
- Handle with the main faults of transport level
- Draw radio fault diagnosis process
- Check the eNodeB radio configuration
- Check quality on the air interface
- Check the EPC configuration
- Handle with the main faults of radio level

Duration

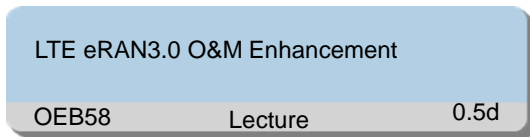
1 working day

Class Size

Min 6, Max 12

2.4.5 LTE eRAN3.0 Product Delta Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

Successful completion of the following courses:
LTE Air Interface
LTE Protocols and Procedures

eNodeB V100R003 Data Configuration
LTE eRAN2.1 Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Outline the new hardware
- Describe O
- M new and enhanced functions

Duration

0.5 working day

Class Size

Min 6, Max 12

2.4.6 LTE eRAN3.0 Transmission Features and Algorithms Training

Training Path

LTE eRAN3.0 Transmission Features and Algorithms		
OET58	Lecture	1d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

Successful completion of the following courses:
eNodeB V100R005 Initial Configuration

Objectives

On completion of this program, the participants will be able to:

- Introduction TRM Algorithms
- Explain transport Resource Configurations and Mapping
- Describe Transport Load Control
- Describe Transmission Security principle
- Explain Transmission Security Mechanisms
- Outline LTE synchronization
- Describe frequency and time synchronization
- List synchronization sources
- Describe working modes of clocks
- Perform synchronization configuration

Duration

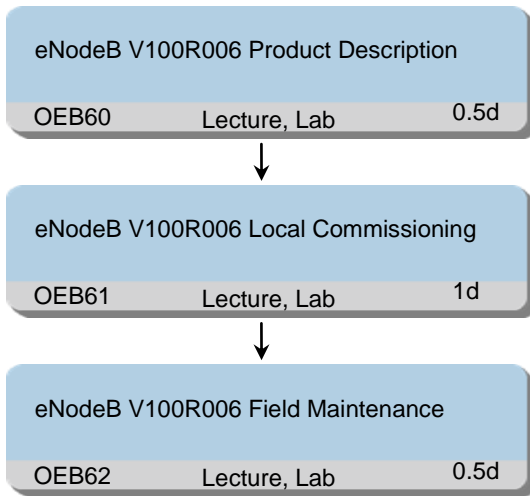
1 working day

Class Size

Min 6, Max 12

2.4.7 LTE eRAN6.0 Field Maintenance Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

Successful completion of the following courses:
LTE System Overview

Objectives

On completion of this program, the participants will

be able to:

- Describe the hardware structure of eNodeB
- Describe the logical structure of eNodeB
- Describe the working principle and functions of eNodeB boards
- Describe the procedure of eNodeB commissioning
- Describe the related concept of eNodeB software and configuration file
- Querying the current version of eNodeB
- Use USB disk to commission the eNodeB
- Commission the eNodeB through LMT
- Verify commissioning result
- Power up/down the eNodeB and connect up LMT to the node
- Find the alarm list of eNodeB
- Perform corrective and preventive maintenance on eNodeB
- Find faulty hardware units and replace them

Duration

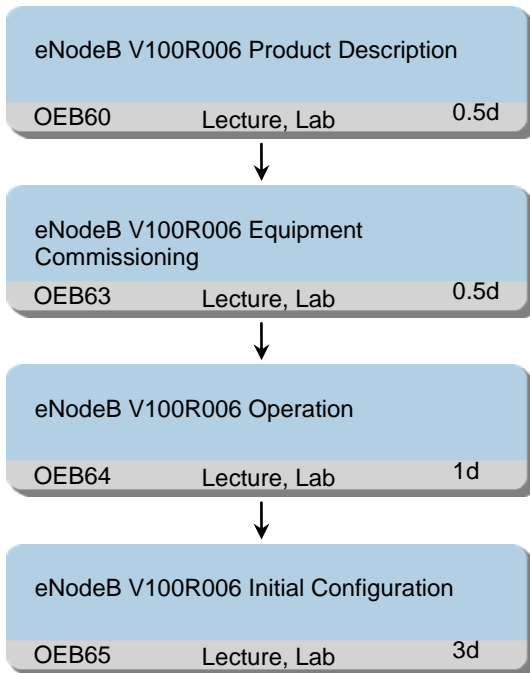
2 working days

Class Size

Min 6, Max 12

2.4.8 LTE eRAN6.0 Operation and Configuration Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

Successful completion of the following courses:
LTE System Overview

Objectives

On completion of this program, the participants will be able to:

- Describe the hardware structure of eNodeB
- Describe the logical structure of eNodeB
- Describe the working principle and functions of eNodeB boards
- Explain the architecture and components of eNodeB operation and maintenance system
- Install LMT software
- Install M2000 client software
- Use LMT login eNodeB
- Use M2000 client Login M2000 server and

eNodeB

- Execute MML in single mode
- Execute MML in batch mode
- Manage alarms of eNodeB
- Manage device, such as querying board states, blocking board and unblocking board
- Manage software, such as querying current software version and backup configuration file
- Manage transport data, such as querying IP address of Ethernet port and querying IP route
- Manage radio data, such as querying cell states and querying neighbor cell
- Manage tracing message, for example: creating a tracing task, checking tracing result, saving result
- Manage real-time monitoring, for example: creating a monitoring task, checking and saving monitoring result
- Describe the procedure of eNodeB commissioning
- Describe the related concept of eNodeB software and configuration file
- Querying the current version of eNodeB
- Commission the eNodeB through M2000
- Verify commissioning result
- Outline the procedure of eNodeB data configuration
- Describe the main table of "eNodeB Summary Data"
- Use LTE Configuration System to create project
- Use LTE Configuration System to import external template
- Use LTE Configuration System to query data configuration and modify data
- Use LTE Configuration System to check up data
- Use LTE Configuration System to export data

Duration

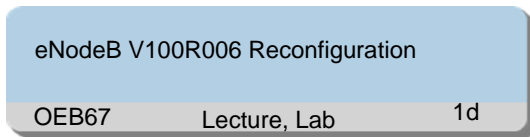
5 working days

Class Size

Min 6, Max 12

2.4.9 LTE eRAN6.0 Reconfiguration Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

Successful completion of the following courses:
LTE System Overview
eNodeB LTE V100R005 Product Description

Objectives

On completion of this program, the participants will be able to:

- Outline CME/MML operation
- Perform capacity expansion
- Perform adding an FDD cell
- Perform changing the cell bandwidth
- Perform adding an MME Connection
- Perform adding an S-GW Connection
- Perform network reconstruction
- Perform changing the cell EARFCNs
- Perform changing the Cell PCI
- Perform changing the Cell ID
- Perform relocating an MME
- Perform relocating an S-GW

Duration

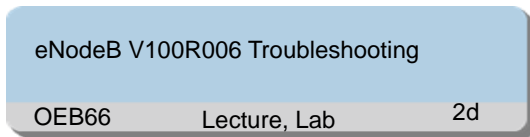
1 working day

Class Size

Min 6, Max 12

2.4.10 LTE eRAN6.0 Troubleshooting Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

Successful completion of the following courses:
LTE System Overview
eNodeB LTE V100R006 Product Description
eNodeB LTE V100R006 Reconfiguration

Objectives

On completion of this program, the participants will be able to:

- Outline the procedure of eNodeB troubleshooting flow
- Perform the alarm management and analysis
- Perform the log collection
- Draw hardware fault handling procedure
- Handle with the main faults of device level
- Draw transport fault handling procedure
- Handle with the main faults of transport level
- Draw radio fault diagnosis process
- Check the eNodeB radio configuration
- Check quality on the air interface
- Check the EPC configuration
- Handle with the main faults of radio level

Duration

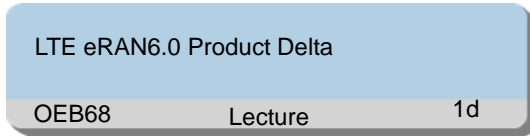
2 working days

Class Size

Min 6, Max 12

2.4.11 LTE eRAN6.0 Product Delta Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

Successful completion of the following courses:
LTE Air Interface
LTE Protocols and Procedures

eNodeB V100R005 Data Configuration
LTE eRAN3.0 Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Describe LMT delta functions
- Describe M2000 client delta functions

Duration

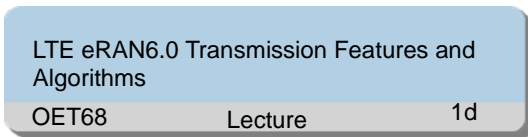
1 working day

Class Size

Min 6, Max 12

2.4.12 LTE eRAN6.0 Transmission Features and Algorithms Training

Training Path



- Introduction TRM Algorithms
- Explain transport Resource Configurations and Mapping
- Describe Transport Load Control
- Describe Transmission Security principle
- Explain Transmission Security Mechanisms
- Outline LTE synchronization
- Describe frequency and time synchronization
- List synchronization sources
- Describe working modes of clocks
- Perform synchronization configuration

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

Successful completion of the following courses:
eNodeB V100R005 Initial Configuration

Objectives

On completion of this program, the participants will be able to:

Duration

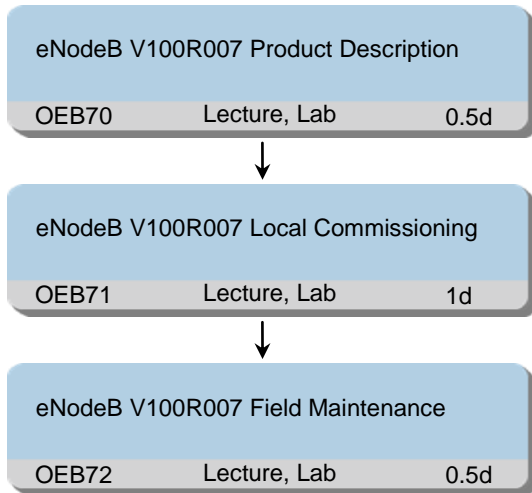
1 working day

Class Size

Min 6, Max 12

2.4.13 LTE eRAN7.0 Field Maintenance Training

Training Path



- Perform local data configuration on power and monitoring device
- Power up/down the eNodeB and connect up LMT to the node
- Find the alarm list of eNodeB
- Perform corrective and preventive maintenance on eNodeB
- Find faulty hardware units and replace them

Duration

2 working days

Class Size

Min 6, Max 12

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview

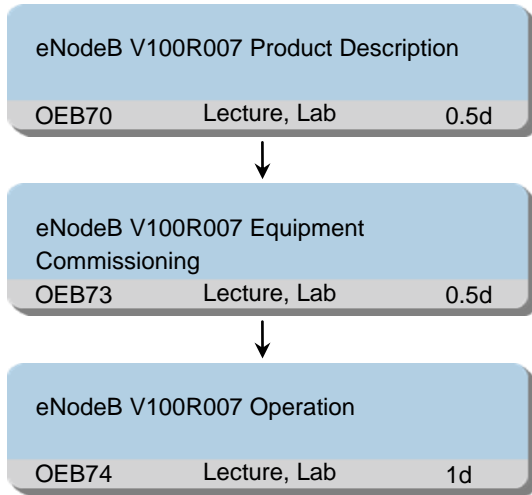
Objectives

On completion of this program, the participants will be able to:

- Describe the hardware structure of eNodeB
- Describe the logical structure of eNodeB
- Describe the working principle and functions of eNodeB boards
- Describe the procedure of eNodeB local commissioning
- Describe the related concept of eNodeB software and configuration file
- Querying the current version of eNodeB
- Use USB disk to commission the eNodeB
- Commission the eNodeB through LMT
- Verify commissioning result
- Describe power and monitoring device

2.4.14 LTE eRAN7.0 Commissioning and Operation Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview

Objectives

On completion of this program, the participants will be able to:

- Describe the hardware structure of eNodeB
- Describe the logical structure of eNodeB
- Describe the working principle and functions of eNodeB boards
- Explain the architecture and components of eNodeB operation and maintenance system

- Install LMT software
- Install U2000 client software
- Use LMT login eNodeB
- Use U2000 client Login U2000 server and eNodeB
- Execute MML in single mode
- Execute MML in batch mode
- Manage alarms of eNodeB
- Manage device, such as querying board states, blocking board and unblocking board
- Manage software, such as querying current software version and backup configuration file
- Manage transport data, such as querying IP address of Ethernet port and querying IP route
- Manage radio data, such as querying cell states and querying neighbor cell
- Manage tracing message, for example: creating a tracing task, checking tracing result, saving result
- Manage real-time monitoring, for example: creating a monitoring task, checking and saving monitoring result
- Describe the procedure of eNodeB commissioning
- Describe the related concept of eNodeB software and configuration file
- Querying the current version of eNodeB
- Commission the eNodeB through U2000
- Verify commissioning result

Duration

2 working days

Class Size

Min 6, Max 12

2.4.15 LTE eRAN7.0 Initial Configuration Training

Training Path

eNodeB V100R007 Initial Configuration		
OEB75	Lecture, Lab	3d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB V100R007 Product Description

Objectives

On completion of this program, the participants will be able to:

- Outline the procedure of eNodeB data configuration
- Implement initial data configuration by MML
- Describe the main table of "eNodeB Summary Data"
- Implement initial data configuration by CME

Duration

3 working days

Class Size

Min 6, Max 12

2.4.16 LTE eRAN7.0 Reconfiguration Training

Training Path

eNodeB V100R007 Reconfiguration		
OEB77	Lecture, Lab	2d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB LTE V100R007 Product Description

Objectives

On completion of this program, the participants will be able to:

- Outline CME/MML operation
- Perform capacity expansion
- Perform adding an FDD cell
- Perform changing the cell bandwidth
- Perform adding an MME Connection
- Perform adding an S-GW Connection
- Perform network reconstruction
- Perform changing the cell EARFCNs
- Perform changing the Cell PCI
- Perform changing the Cell ID
- Perform relocating an MME
- Perform relocating an S-GW

Duration

2 working day

Class Size

Min 6, Max 12

2.4.17 LTE eRAN7.0 Troubleshooting Training

Training Path

eNodeB V100R007 Troubleshooting		
OEB76	Lecture, Lab	2d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB LTE V100R007 Product Description
- eNodeB LTE V100R007 Reconfiguration

Objectives

On completion of this program, the participants will be able to:

- Outline the procedure of eNodeB troubleshooting flow
- Perform the alarm management and analysis
- Perform the log collection
- Draw hardware fault handling procedure
- Handle with the main faults of device level
- Draw transport fault handling procedure
- Handle with the main faults of transport level
- Draw radio fault diagnosis process
- Check the eNodeB radio configuration
- Check quality on the air interface
- Check the EPC configuration
- Handle with the main faults of radio level

Duration

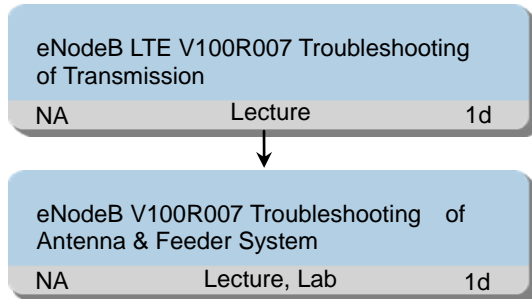
2 working days

Class Size

Min 6, Max 12

2.4.18 LTE eRAN7.0 Advanced Troubleshooting Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB LTE V100R007 Product Description
- eNodeB LTE V100R007 Reconfiguration

Objectives

On completion of this program, the participants will be able to:

- Outline the procedure of eNodeB

troubleshooting flow

- Perform the alarm management and analysis
- Draw hardware fault handling procedure
- Handle with the main faults of device level
- Draw transport fault handling procedure
- Handle with the main faults of transport level
- Draw radio fault diagnosis process
- Check the eNodeB radio configuration
- Handle with the main faults of radio level
- Understand Antenna & Feeder system working principle
- Understand PIM fault and perform troubleshooting by U2000 and WebLMT
- Understand VSWR fault and perform troubleshooting by U2000 and WebLMT
- Understand TMA fault and perform troubleshooting by U2000 and WebLMT

Duration

2 working days

Class Size

Min 6, Max 12

2.4.19 LTE eRAN7.0 Product Delta Training

Training Path

LTE eRAN7.0 Product Delta		
OEB78	Lecture	1d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE eRAN6.0 Operation and Configuration Training

Objectives

On completion of this program, the participants will be able to:

- Describe eRAN7.0 new hardware
- Describe eRAN7.0 new O&M functions and feature
- Describe multi-BBU interconnection feature
- Describe USU hardware and its implementation in multi-BBU interconnection feature

Duration

1 working day

Class Size

Min 6, Max 12

2.4.20 LTE eRAN7.0 Transmission Features and Algorithms Training

Training Path

LTE eRAN7.0 Transmission Features and Algorithms		
OET78	Lecture	1.5d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- eNodeB V100R007 Product Description

Objectives

On completion of this program, the participants will be able to:

- Explain TRM features and algorithms
- Explain transmission security solution
- Explain synchronization solution
- Explain S1/X2 Self-Management feature and algorithms
- Explain Automatic OMCH Establishment feature

Duration

1.5 working day

Class Size

Min 6, Max 12

2.5 WBT

2.5.1 LTE SAE System Overview(WBT)

Training Path

LTE SAE System Overview(WBT)		
OEA00	Lecture	4h

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

Basic knowledge of mobile communications

Objectives

On completion of this program, the participants will be able to:

- Summarize the evolution of 3GPP releases
- Explain the logical architecture of EPS (E-UTRAN and EPC)
- Give an overview of the interfaces in EPS
- Describe the Evolved Packet Core (EPC)
- Describe the role of the MME and the S-GW
- Describe the S1, X2 and radio-interface and their protocol stacks

- Describe the radio interface techniques used in uplink and downlink
- Describe the channel structure of the radio interface
- Describe the time-domain and Frequency-domain structure in the radio interface in UL and DL for both FDD and TDD mode
- Have a good understanding of the OFDM principle, signal generation and processing
- Detail the reference symbols in DL
- Describe MIMO technology
- Have a good understanding of the SC-FDMA principle, signal generation and processing
- Describe Huawei eNodeB Family
- Describe Huawei LTE products and application scenarios
- Describe Huawei LTE products Operation and Maintenance System

Duration

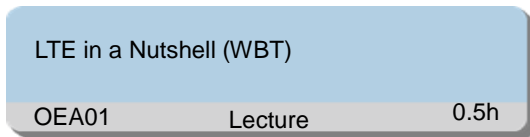
4 hours

Class Size

Min 6, Max 12

2.5.2 LTE in a Nutshell (WBT)

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

Basic knowledge of mobile communications

Objectives

On completion of this program, the participants will be able to:

- Describe the state of wireless networks and

trends for next generation wireless networks

- Sketch the System Architecture Evolution (SAE) for LTE and its interfaces
- Describe OFDM concepts and how it is used in LTE
- Define the key features of the LTE air interface
- Walk through the mobile device operations from power-up to service setup
- Explain how uplink and downlink traffic are handled in LTE networks
- Walk through a high level service flow setup on an end-to-end basis
- Explain deployment scenarios of LTE networks

Duration

0.5hour

Class Size

Min 6, Max 12