Customer Training Catalog
Training Programs
WCDMA RNP&RNO

HUAWEI Learning Service
2019
CONTENTS

1 Training Solution ........................................................................................................................................ 3
  1.1 WCDMA RNP&RNO Training Path ................................................................................................. 3
  1.2 Training Solution .............................................................................................................................. 4
    1.2.1 WCDMA Radio Network Planning Engineer Learning Solution .............................................. 4
    1.2.2 WCDMA Radio Network Optimization Engineer Learning Program .................................. 5
  1.3 Course Description ............................................................................................................................ 6
    1.3.1 WCDMA RAN Principle Training(MOOC) ................................................................................. 6
    1.3.2 WCDMA RAN Overview Training ........................................................................................... 7
    1.3.3 WCDMA RAN Principle Training ............................................................................................ 8
    1.3.4 WCDMA HSPA+ Principle Training ......................................................................................... 10
    1.3.5 WCDMA Radio Network Signaling Collection and Analysis Training .................................... 12
    1.3.6 WCDMA Radio Network Design and Planning Training ....................................................... 14
    1.3.7 WCDMA Radio Network LAC and Cell Parameter Planning Training ............................... 16
    1.3.8 WCDMA Radio Network Tuning Training .............................................................................. 17
    1.3.9 WCDMA Radio Network KPI Optimization Training .......................................................... 19
    1.3.10 WCDMA RAN Basic Features and Algorithms Training ..................................................... 21
    1.3.11 WCDMA RAN Advanced Features and Algorithms Training .............................................. 22
    1.3.12 WCDMA HSPA/HSPA+ Radio Network Optimization Training ......................................... 24
    1.3.13 WCDMA Capacity Assessment and Improvement Solution Training .................................. 25
    1.3.14 WCDMA Multi-Band and Multi-Carrier Solution Training .................................................. 26
    1.3.15 U900 Refarming Solution Training ......................................................................................... 28
1 Training Solution

1.1 WCDMA RNP&RNO Training Path

Radio Network Planning Engineer

<table>
<thead>
<tr>
<th>Training Stage</th>
<th>Course Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Training</td>
<td>WCDMA Key Event Assurance Solution Training</td>
</tr>
<tr>
<td></td>
<td>Lecture (1D)</td>
</tr>
<tr>
<td></td>
<td>WCDMA Experience Improvement Solution Training</td>
</tr>
<tr>
<td></td>
<td>Lecture (5D)</td>
</tr>
<tr>
<td></td>
<td>WCDMA Capacity Assessment and Improvement Solution Training</td>
</tr>
<tr>
<td></td>
<td>Lecture (3D)</td>
</tr>
</tbody>
</table>

Intermediate Training

<table>
<thead>
<tr>
<th>Training Stage</th>
<th>Course Details</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>U900 Refarming Solution Training</td>
</tr>
<tr>
<td></td>
<td>Lecture (3D)</td>
</tr>
<tr>
<td></td>
<td>WCDMA Multi-Band and Multi-Carrier Solution Training</td>
</tr>
<tr>
<td></td>
<td>Lecture (1D)</td>
</tr>
<tr>
<td></td>
<td>WCDMA Radio Network Design and Planning Training</td>
</tr>
<tr>
<td></td>
<td>Lecture (3D)</td>
</tr>
</tbody>
</table>

Basic Training

<table>
<thead>
<tr>
<th>Training Stage</th>
<th>Course Details</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WCDMA HSPA+ Principle Training</td>
</tr>
<tr>
<td></td>
<td>MOOC+Lecture (1W+2D)</td>
</tr>
<tr>
<td></td>
<td>WCDMA RAN Principle Training</td>
</tr>
<tr>
<td></td>
<td>Lecture (4D)</td>
</tr>
<tr>
<td></td>
<td>WCDMA RAN Overview Training</td>
</tr>
<tr>
<td></td>
<td>Lecture (1D)</td>
</tr>
</tbody>
</table>

Radio Network Optimization Engineer

<table>
<thead>
<tr>
<th>Training Stage</th>
<th>Course Details</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WCDMA RAN Network Advanced Feature and Algorithm Training</td>
</tr>
<tr>
<td></td>
<td>Lecture (3D)</td>
</tr>
<tr>
<td></td>
<td>WCDMA Radio Network KPI Optimization Training</td>
</tr>
<tr>
<td></td>
<td>Lecture (4D)</td>
</tr>
<tr>
<td></td>
<td>WCDMA Radio Network Signaling Collection and Analysis Training</td>
</tr>
<tr>
<td></td>
<td>Lecture (1D)</td>
</tr>
<tr>
<td></td>
<td>WCDMA HSPA/HSPA+ Radio Network Optimization Training</td>
</tr>
<tr>
<td></td>
<td>Lecture (3D)</td>
</tr>
</tbody>
</table>
1.2 Training Solution

The standard WCDMA RNP&RNO learning solution is designed for the 2 job roles:

<table>
<thead>
<tr>
<th>Training Programs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>WCDMA Radio Network Planning Engineer Learning Solution(1.3.1)</td>
<td></td>
</tr>
<tr>
<td>WCDMA Radio Network Optimization Engineer Learning Solution(1.3.2)</td>
<td></td>
</tr>
</tbody>
</table>

1.2.1 WCDMA Radio Network Planning Engineer Learning Solution

<table>
<thead>
<tr>
<th>Learning Phase</th>
<th>Programs</th>
<th>Level</th>
<th>MOOC Duration (week)</th>
<th>ILT Duration (day)</th>
<th>S-OJT</th>
<th>Class Size (Person)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WCDMA Basics Training</td>
<td>WCDMA RAN Principle Training</td>
<td>III</td>
<td>/</td>
<td>4</td>
<td>/</td>
<td>6~12</td>
</tr>
<tr>
<td></td>
<td>WCDMA HSPA+ Principle Training</td>
<td>III</td>
<td>1</td>
<td>2</td>
<td>/</td>
<td>6~12</td>
</tr>
<tr>
<td>WCDMA Intermediate Training</td>
<td>WCDMA Radio Network Design and Planning Training</td>
<td>III</td>
<td>/</td>
<td>3</td>
<td>/</td>
<td>6~12</td>
</tr>
<tr>
<td></td>
<td>WCDMA Multi-Band and Multi-Carrier Solution Training</td>
<td>III</td>
<td>/</td>
<td>1</td>
<td>/</td>
<td>6~12</td>
</tr>
<tr>
<td></td>
<td>U900 Refarming Solution Training</td>
<td>III</td>
<td>/</td>
<td>3</td>
<td>/</td>
<td>6~12</td>
</tr>
<tr>
<td>WCDMA Advanced Training</td>
<td>WCDMA Capacity Assessment and Improvement Solution Training</td>
<td>IV</td>
<td>/</td>
<td>3</td>
<td>/</td>
<td>6~12</td>
</tr>
</tbody>
</table>

Level Description: I: Basic Course  II: Intermediate Course  III: Advanced Course  IV: Expert Course
### 1.2.2 WCDMA Radio Network Optimization Engineer Learning Program

<table>
<thead>
<tr>
<th>Training Program List</th>
<th>Courses</th>
<th>Level</th>
<th>MOOC Duration (week)</th>
<th>ILT Duration (day)</th>
<th>S-OJT</th>
<th>Class Size (Person)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WCDMA Basics Training</strong></td>
<td>WCDMA RAN Principle Training</td>
<td>III</td>
<td>/</td>
<td>4</td>
<td>/</td>
<td>6~12</td>
</tr>
<tr>
<td></td>
<td>WCDMA HSPA+ Principle Training</td>
<td>III</td>
<td>/</td>
<td>2</td>
<td>/</td>
<td>6~12</td>
</tr>
<tr>
<td></td>
<td>WCDMA RAN Radio Network Features and Algorithms Training</td>
<td>III</td>
<td>/</td>
<td>6</td>
<td>/</td>
<td>6~12</td>
</tr>
<tr>
<td><strong>WCDMA Intermediate Training</strong></td>
<td>WCDMA Radio Network Signaling Collection and Analysis Training</td>
<td>III</td>
<td>/</td>
<td>1</td>
<td>/</td>
<td>6~12</td>
</tr>
<tr>
<td></td>
<td>WCDMA Radio Network Tuning Training</td>
<td>III</td>
<td>/</td>
<td>2</td>
<td>/</td>
<td>6~12</td>
</tr>
<tr>
<td></td>
<td>WCDMA Radio Network KPI Optimization Training</td>
<td>III</td>
<td>/</td>
<td>4</td>
<td>/</td>
<td>6~12</td>
</tr>
<tr>
<td></td>
<td>WCDMA RAN Radio Network Features and Algorithms Advanced Training</td>
<td>III</td>
<td>/</td>
<td>3</td>
<td>/</td>
<td>6~12</td>
</tr>
<tr>
<td></td>
<td>WCDMA HSPA/HSPA+ Radio Network Optimization Training</td>
<td>IV</td>
<td>/</td>
<td>3</td>
<td>/</td>
<td>6~12</td>
</tr>
<tr>
<td><strong>WCDMA Advanced Training</strong></td>
<td>WCDMA Capacity Assessment and Improvement Solution Training</td>
<td>IV</td>
<td>/</td>
<td>3</td>
<td>/</td>
<td>6~12</td>
</tr>
</tbody>
</table>

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

1.3.1 WCDMA RAN Principle Training (MOOC)

Prerequisites

- Familiar with WCDMA Principles

Objectives

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

- Describe HSDPA key technologies.
- Describe HSUPA key technologies.

Training Content

WCDMA HSPA Principles

- WCDMA HSDPA Principles
  - HSDPA Introduction
  - HSDPA Key Techniques
  - HSDPA Physical Layer Channel
  - HSDPA Layer2 Protocol

- WCDMA HSUPA Principles
  - Introduction of HSUPA
  - HSUPA Concepts
  - Physical Layer Channels and Processing
  - MAC Protocols and Procedure

Duration

1 week

Class Size

Max 50
1.3.2 WCDMA RAN Overview Training

Training Path

Target Audience

All Technical People

Prerequisites

- Basic knowledge of mobile communications

Objectives

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

- Outline the development of 3G.
- Describe the architecture of WCDMA system.
- Describe the key features and technologies of WCDMA.

Training Content

OWA00 WCDMA RAN Overview

- WCDMA RAN Overview
  - 3G Overview
  - CDMA Principle
  - WCDMA Network Architecture and protocol structure
  - WCDMA Wireless Fundamental

Duration

1 working day

Class Size

Min 6, Max 12
1.3.3 WCDMA RAN Principle Training

Training Path

```
OWA01 Lecture 2d

OWA20 Lecture 2d
```

Target Audience

- Network Deployment Engineers
- Optimization Engineers
- System Technicians
- System Engineers

Prerequisites

- WCDMA RAN Overview Training

Objectives

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

- Describe the WCDMA radio interface protocol architecture.
- Describe the WCDMA RAN channel structure.
- Describe the WCDMA RAN signaling procedures: paging, call process, handover, etc.
- Describe HSDPA key technologies.
- Describe HSUPA key technologies.

Training Content

**OWA01 WCDMA Air Interface**

- WCDMA Radio Interface and Physical Layer
  - Physical Layer Overview
  - Physical Channels
  - Physical Channel Structure and Functions
  - Channel Mapping
  - Physical Layer Procedure

- WCDMA RAN Signaling Flow
  - UTRAN Network Overview
  - Basic Concepts about UTRAN
  - UTRAN Signaling Procedure
  - System Information Broadcast
  - Paging
Call Process
- Handover
- URA/Cell Update

OWA20 WCDMA HSPA Principles
- WCDMA HSDPA Principles
  - HSDPA Introduction
  - HSDPA Key Techniques
  - HSDPA Physical Layer Channel
  - HSDPA Layer2 Protocol
- WCDMA HSUPA Principles
  - Introduction of HSUPA
  - HSUPA Concepts
  - Physical Layer Channels and Processing
  - MAC Protocols and Procedure

Duration

4 working days

Class Size

Min 6, Max 12
1.3.4 WCDMA HSPA+ Principle Training

Training Path

WCDMA HSPA+ Principles
OWA21 Lecture 2d

Target Audience

Network Deployment Engineers
Optimization Engineers
System Technicians
System Engineers

Prerequisites

- WCDMA RAN Overview Training
- WCDMA RAN Principle Training

Objectives

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

- Describe HSPA+ evolution and standards.
- Describe HSPA+ key technologies.
- Describe the Prerequisites and Application Scenario of different HSPA+ technology.
- Analyze the benefit and impaction of different HSPA+ technology.

Training Content

OWA21 WCDMA HSPA+ Principles.

- WCDMA HSPA+ Principles
  - Downlink Enhanced L2
  - 2x2 MIMO
  - Downlink 64QAM
  - Downlink Enhanced CELL_FACH Operation
  - Continuous packet connectivity (CPC)
  - Uplink 16QAM
  - Uplink Enhanced L2
  - Downlink MIMO+64QAM
  - DC-HSDPA
  - HSUPA Dynamic TTI Adjustment
  - Downlink DC-HSDPA+MIMO
  - Traffic-Based Activation and Deactivation of Secondary Carrier in Dual-Carrier HSDPA
  - E-DPCCH Boosting
  - Enhanced Uplink CELL_FACH
  - DC-HSUPA
- DB-HSDPA+MIMO+64QAM
- 4C+MIMO+64QAM
- Flexible DC/DB-HSDPA
- Inter-NodeB DB-HSDPA

**Duration**

2 working days

**Class Size**

Min 6, Max 12
1.3.5 WCDMA Radio Network Signaling Collection and Analysis Training

Training Path

![WCDMA Radio Network Signaling collection and analysis](image)

OWO02 Lecture 1d

Target Audience

- Optimization Engineers
- System Technicians
- System Engineers

Prerequisites

- WCDMA RAN Overview Training
- WCDMA RAN Principle Training
- WCDMA HSPA+ Principles Training

Objectives

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

- Execute signaling trace, real-time monitoring and collect data.
- Describe the category of UTRAN interfaces and signaling of type procedures.
- Analyze the signaling for troubleshooting.

Training Content

OWO02 WCDMA Radio Network Signaling collection and analysis

- HUAWEI UTRAN Trace and Monitoring
  - RNC Trace and Monitoring Overview
  - Signaling Trace
  - Real-time Monitoring
  - Case Study
- Signaling Analysis of Typical UTRAN Procedures
  - Category of UTRAN interfaces and signaling
  - Signaling Analysis of Typical UTRAN Procedures
  - System Information Analysis
  - Paging Signaling Analysis
  - RRC Setup Signaling Analysis
  - NAS Signaling Analysis
  - RAB Assignment Signaling Analysis
  - Intra-Frequency Handover Signaling Analysis
  - Inter-Frequency/Inter-RAT Handover Signaling Analysis
Duration

1 working day

Class Size

Min 6, Max 12
1.3.6 WCDMA Radio Network Design and Planning Training

Training Path

Target Audience

- Network Deployment Engineers
- System Technicians
- System Engineers

Prerequisites

- WCDMA RAN Overview Training
- WCDMA RAN Principle Training
- WCDMA HSPA+ Principles Training

Objectives

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

- Describe the principle of radio network planning.
- Analyze and construct the traffic model of WCDMA.
- Calculate WCDMA DL and UL radio link budget.
- Perform the WCDMA uplink and downlink capacity dimensioning.
- Perform HSDPA/HSUPA coverage planning and capacity dimensioning.
- Analyze the impacts of HSPA+ features on dimensioning, including DL 64QAM, MIMO, CPC, DC-HSDPA, 64QAM+MIMO, UL16QAM, DC-MIMO, DC-HSUPA, etc.

Training Content

OWP00 WCDMA Radio Network Planning

- WCDMA Radio Network Coverage Dimensioning
  - WCDMA Radio Network Planning Process
  - R99 Coverage Planning
  - Process of R99 Coverage Planning
  - R99 Uplink Budget
  - R99 Downlink Budget
  - HSDPA Coverage Planning

- WCDMA Radio Network Capacity Dimensioning
  - Traffic Model
Overview of traffic model
CS traffic model
PS traffic model
Interference Analysis
Uplink Interference Analysis
Downlink Interference Analysis
Capacity Dimensioning
R99 Capacity Dimensioning
HSDPA Dimensioning
CE Dimensioning
Network Dimensioning Flow
- WCDMA Radio Network Dimensioning Practice
  - Description of WCDMA Radio Network Dimensioning Practice
OWP13 WCDMA HSPA and HSPA+ Planning
- WCDMA HSPA and HSPA+ Dimensioning
  - HSDPA Dimensioning
  - HSDPA Link Budget
  - HSDPA Capacity Dimensioning
  - HSDPA CE Dimensioning
  - HSUPA Dimensioning
  - HSUPA Link Budget
  - HSUPA Capacity Dimensioning
  - HSUPA CE Dimensioning
  - HSPA+ Dimensioning
  - HSPA+ Dimensioning Overview
    - Impact on Dimensioning - DL 64QAM
    - Impact on Dimensioning - MIMO
    - Impact on Dimensioning - CPC
    - Impact on Dimensioning - DC-HSDPA
    - Impact on Dimensioning - MIMO + DL 64QAM
    - Impact on Dimensioning - UL 16QAM
    - Impact on Dimensioning - DC-MIMO
    - Impact on Dimensioning - DC-HSUPA

Duration
3 working days

Class Size
Min 6, Max 12
1.3.7 WCDMA Radio Network LAC and Cell Parameter Planning Training

Training Path

Target Audience

Network Deployment Engineers
Optimization Engineers
System Technicians
Planning Engineers

Prerequisites

- WCDMA RAN Overview Training
- WCDMA RAN Principle Training
- WCDMA HSPA+ Principles Training

Objectives

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

- Perform radio network LAC planning.
- Perform Neighbor Planning.
- Perform Scrambling Code Planning.

Training Content

OWP01 WCDMA Radio Network LAC Planning

- WCDMA LAC Planning
  - Description of WCDMA LAC Planning

OWP02 WCDMA Radio Network Cell Parameter Planning

- WCDMA Radio Network Cell Parameter Planning
  - Description of WCDMA Radio Network Cell Parameter Planning

Duration

2 working days

Class Size

Min 6, Max 12
1.3.8 WCDMA Radio Network Tuning Training

Training Path

Target Audience

Optimization Engineers
System Technicians
System Engineers

Prerequisites

- WCDMA RAN Overview Training
- WCDMA RAN Principle Training
- WCDMA HSPA+ Principles Training

Objectives

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

- Describe WCDMA Radio Network Optimization Flow.
- Perform do single site verification.
- Solve the common problems in single site verification.
- Perform RF optimization.
- Solve the neighbor problems in RF optimization.

Training Content

OWO00 WCDMA Radio Network Tuning

- WCDMA UTRAN Optimization Flow
  - Introduction of Optimization Flow
  - The preparation for the Optimization Project
  - Single Site Verification
  - RF Optimization
  - Parameters Optimization
  - Optimization Report

- WCDMA RF Optimization
  - RF Optimization Workflow
  - Typical Problems Analysis in RF optimization
  - RF case related to neighbor cell list
  - RF case related to bad coverage
  - RF case related to interference
Duration

2 working days

Class Size

Min 6, Max 12
1.3.9 WCDMA Radio Network KPI Optimization Training

Training Path

Target Audience

Optimization Engineers
System Technicians
System Engineers

Prerequisites

- WCDMA RAN Overview Training
- WCDMA RAN Principle Training
- WCDMA HSPA+ Principles Training
- WCDMA Radio Network Features and Algorithms Training
- WCDMA Performance Management Training

Objectives

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

- Introduce WCDMA radio network access, retainability, mobility, traffic KPI counters.
- Evaluate the coverage and solve coverage problem.
- Evaluate the interference and locate and clean the resource of interference.
- Evaluate the access performance and solve access problems.
- Evaluate the mobility performance and solve handover problem.
- Evaluate the retainability performance and solve call drop problem.

Training Content

WO034 WCDMA Radio Network KPI Introduction

- WCDMA Access KPI and Relative Counters
  - Description of WCDMA Access KPI and Relative Counters
- WCDMA Call Drop KPI and Relative Counters
  - Description of WCDMA Call Drop KPI and Relative Counters
- WCDMA Mobility KPI and Relative Counters
  - Description of WCDMA Mobility KPI and Relative Counters
- WCDMA Traffic KPI and Relative Counters
  - Description of WCDMA Traffic KPI and Relative Counters
OWO01 WCDMA Radio Network Optimization

- **WCDMA Coverage Problems Analysis**
  - Classification Of Coverage Problem
  - Coverage Optimization Flow
  - Case Analysis

- **WCDMA Interference Problem Analysis**
  - Relative Concepts regarding Interference
  - UL Interference Analysis
  - DL Interference Analysis

- **WCDMA Access Problem Analysis**
  - Access Failure Concept
  - Flow and Methods for Analyzing Access
  - Coverage Analysis
  - Interference Analysis
  - Typical Access Case Study

- **WCDMA Handover Problems Analysis**
  - Basic Concepts of Handover Problem Optimization
  - Soft Handover Problem Analysis
  - SHO Problem Analysis
  - Hard Handover Problem Analysis
  - HHO Problem Cases
  - Inter-RAN Handover Problem Analysis

- **WCDMA Call Drop Problems Analysis**
  - Definition of Call Drop and Traffic Statistics Indexes
  - DT/CQT Optimization Flow
  - Case Analysis

**Duration**

4 working days

**Class Size**

Min 6, Max 12
1.3.10 WCDMA RAN Basic Features and Algorithms Training

Training Path

- WCDMA Radio Network Basic Features and Algorithms (WO26 Lecture 6d)

Target Audience

- Optimization Engineers
- System Technicians
- System Engineers

Prerequisites

- WCDMA RAN Overview Training
- WCDMA RAN Principle Training
- WCDMA HSPA+ Principles Training

Objectives

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

- Describe WCDMA Idle mode behaviors algorithm, power control algorithm, handover algorithm, admission control algorithms and load control algorithms.
- Apply the main parameters of idle mode behaviors algorithm in optimization.
- Apply the main parameters of power control algorithm in optimization.
- Apply the main parameters of admission control algorithms in optimization.
- Apply the main parameters of load control algorithms in optimization.

Training Content

WO26 WCDMA Radio Network Features and Algorithms

- WCDMA UE Behaviors in Idle Mode
  - Description of WCDMA RAN UE Behaviors in Idle Mode
- WCDMA Power Control Algorithm and Parameters
  - Description of WCDMA RAN Power Control Algorithm and Parameters
- WCDMA Handover Algorithm and Parameters
  - Description of WCDMA RAN Handover Algorithm and Parameters
- WCDMA Admission Control Algorithm and Parameters
  - Description of WCDMA RAN Admission Control Algorithm and Parameters
- WCDMA Load Congestion Control Algorithm and Parameters
  - Description of WCDMA RAN Load Congestion Control Algorithm and Parameters

Duration

6 working days
Class Size

Min 6, Max 12

1.3.11 WCDMA RAN Advanced Features and Algorithms Training

Training Path

WCDMA Radio Network Rate Control Features and Algorithms
OWO29 Lecture 1.5d

WCDMA Radio Network Interoperability Features and Algorithms
OWO32 Lecture 1.5d

WCDMA Differentiated QoS Management
OWO85 Lecture 1d

WCDMA Key Event Assurance Solution
OWO86 Lecture 1d

Target Audience

Optimization Engineers
System Technicians
System Engineers

Prerequisites

● WCDMA RAN Overview Training
● WCDMA RAN Principle Training
● WCDMA HSPA+ Principles Training
● WCDMA Radio Network Features and Algorithms Training

Objectives

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

● Describe the principle of Radio Network Rate Control and Radio Network Interoperability Features and Algorithms of WCDMA
● Apply the main parameters of DCCC algorithm in optimization.
● Apply the main parameters of state transition algorithm in optimization.
● Apply the main parameters of interoperability algorithm between UMTS and GSM in optimization.
● Apply the main parameters of Interoperability algorithm between UMTS and LTE in optimization.
Training Content

**WO029 WCDMA Radio Network Rate Control Features and Algorithms**
- WCDMA DCCC Algorithm and Parameters
  - DCCC Overview
  - DCCC Based on Traffic Volume
  - DCCC Based on Throughput
  - DCCC Based on Link Stability
  - DCCC Based on Basic Congestion
- WCDMA State Transition
  - UE State Transition Overview
  - Basic UE State Transition Description
  - UE State Transition Application

**WO032 WCDMA Radio Network Interoperability Features and Algorithms**
- WCDMA Interoperability Between UMTS and GSM
  - Description of WCDMA RAN Interoperability Between UMTS and GSM
- WCDMA Interoperability Between UMTS and LTE
  - Description of WCDMA RAN Interoperability Between UMTS and LTE

**WO085 WCDMA Differentiated QoS Management Features and Algorithms**
- WCDMA Terminal Black List
  - Description of WCDMA RAN Terminal Black List
- WCDMA Platinum User Prioritizing
  - Description of Platinum User Prioritizing
  - Implementation of Platinum User Prioritizing
  - Configuration of Platinum User Prioritizing
  - Performance of Platinum User Prioritizing
- WCDMA Differentiated Service Based on Resource Reservation
  - Description of Differentiated Service Based on Resource Reservation
  - Implementation of Differentiated Service Based on Resource Reservation
  - Configuration of Differentiated Service Based on Resource Reservation
  - Performance of Differentiated Service Based on Resource Reservation

**WO086 Key Event Assurance Solution Features and Algorithms**
- WCDMA Camping Strategy Switch for Mass Event
  - Description of WCDMA Camping Strategy Switch for Mass Event
- WCDMA Automatic Congestion Handler
  - Description of WCDMA Automatic Congestion Handler
- WCDMA RB parking
  - Description of WCDMA RB parking

**Duration**
- 5 working days
Class Size
Min 6, Max 12

1.3.12 WCDMA HSPA/HSPA+ Radio Network Optimization Training

Training Path

```
<table>
<thead>
<tr>
<th>Training Step</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>WCDMA HSPA Radio Resource Management</td>
<td></td>
</tr>
<tr>
<td>OWO70 Lecture</td>
<td>2d</td>
</tr>
<tr>
<td>WCDMA HSPA/HSPA+ Throughput Troubleshooting</td>
<td></td>
</tr>
<tr>
<td>OWO75 Lecture</td>
<td>1d</td>
</tr>
</tbody>
</table>
```

Target Audience
- Optimization Engineers
- System Technicians
- System Engineers

Prerequisites
- WCDMA RAN Overview Training
- WCDMA RAN Principle Training
- WCDMA HSPA+ Principles Training
- WCDMA Radio Network Features and Algorithms Training

Objectives
On completion of this program, the participants will be able to:
- Describe HSDPA, HSUPA and HSPA+ Radio Resource Algorithm (RRM).
- Perform the troubleshooting for HSDPA throughput problems.
- Perform the troubleshooting for HSUPA throughput problems.
- Perform the troubleshooting for HSPA+ throughput problems.

Training Content

OWO70 WCDMA HSPA Radio Resource Management
- WCDMA HSDPA RRM and Parameters
  - Description of WCDMA HSDPA RRM and Parameters
- WCDMA HSUPA RRM and Parameters
  - Description of WCDMA HSUPA RRM and Parameters
- WCDMA DC HSUPA
  - Description of WCDMA DC HSUPA

OWO75 WCDMA HSPA/HSPA+ Throughput Troubleshooting
- WCDMA HSPA+ Throughput Troubleshooting
  - HSDPA Throughput Problems
HSDPA Throughput Overview
- Low or Fluctuating HSDPA Throughput Troubleshooting
- No HSDPA Throughput Troubleshooting
- HSUPA Throughput Problems
- HSUPA Throughput Overview
- Low or Fluctuating HSUPA Throughput Troubleshooting
- Failure to Establish the HSUPA Service
- Failure to Establish an HSUPA 5.76 Mbit/s Service
- HSPA+ Throughput Problems
- HSPA+ 64QAM Problems
- HSPA+ MIMO Problems
- HSPA+ DC-HSDPA Problems

Duration
3 working days

Class Size
Min 6, Max 12

1.3.13 WCDMA Capacity Assessment and Improvement Solution Training

Training Path

![Diagram of training paths]

Target Audience

Optimization Engineers
System Technicians
System Engineers

Prerequisites

- WCDMA RAN Overview Training
- WCDMA RAN Principle Training
- WCDMA HSPA+ Principles Training
- WCDMA RAN Radio Network Features and Algorithms Training
Objectives

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

- Perform WCDMA UL Capacity Assessment.
- Describe UL Capacity Improvement Solution and apply them to improve the UL capacity.
- Perform WCDMA DL Capacity Assessment.
- Describe DL Capacity Improvement Solution and apply them to improve the DL capacity.

Training Content

WO81 WCDMA UL Capacity Assessment and Improvement Solution

- WCDMA UL Capacity Assessment and Improvement Solution
  - Introduce the method to solve:
    - DL Device Resource limitation.

WO82 WCDMA DL Capacity Assessment and Improvement Solution

- WCDMA DL Capacity Assessment and Improvement Solution
  - Introduce the method to solve:
    - DL Device Resource limitation.

Duration

3 working days

Class Size

Min 6, Max 12

1.3.14 WCDMA Multi-Band and Multi-Carrier Solution Training

Training Path

| WCDMA Multi-Band and Multi-Carrier Solution | OWP20 Lecture | 1d |

Target Audience

Optimization Engineers
System Technicians
System Engineers

Prerequisites

- WCDMA RAN Overview Training
- WCDMA RAN Principle Training
- WCDMA HSPA+ Principles Training
- WCDMA Radio Network Features and Algorithms Training
Objectives

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

● Describe the policies of multi-band and multi-carrier.
● Implement the multi-band and multi-carrier strategy based on the application scenarios.
● Analyze the problem caused by multi-band and multi-carrier strategy.

Training Content

OWP20 WCDMA Multi-Band and Multi-Carrier Solution

● WCDMA Multi-Band and Multi-Carrier Solution
  ■ Requirements of expansion
  ■ Network policies
  ■ Network application scenario and solution
  ■ Carriers in the Same Band
  ■ 3 or 4 Carriers in the Same Band
  ■ 2, 3 or 4 Carriers in the Different Band
  ■ Strategy evaluation

Duration

1 working day

Class Size

Min 6, Max 12
1.3.15 U900 Refarming Solution Training

Training Path

UMTS 900M Coverage Solution
OWP21 Lecture 2.5d

UMTS 900M Interference Cancellation Features
OWO80 Lecture 0.5d

Target Audience

Optimization Engineers
System Technicians
System Engineers

Prerequisites

- WCDMA RAN Overview Training
- WCDMA RAN Principle Training
- WCDMA HSPA+ Principles Training
- WCDMA Radio Network Features and Algorithms Training

Objectives

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

- Describe the application scenarios of the UMTS 900M coverage solution.
- Perform UMTS 900M Refarming.
- Deploy UMTS 900M.
- Apply relative feature to reduce UMTS 900M interference.

Training Content

OWP21 UMTS 900M Coverage Solution

- UMTS 900M Coverage Solution
  - U900 Background
  - U900 Principle
  - U900 solution
  - U900 Application
- UMTS 900M Frequency Planning
  - Description of UMTS 900M Frequency Planning
- UMTS 900M Service Bearer Strategy
  - Description of UMTS 900M Service Bearer Strategy

OWO80 UMTS 900M Interference Cancellation Features

- WCDMA Narrowband Interference Suppression
- Description of Narrowband Interference Suppression
- Implementation of Narrowband Interference Suppression
- Configuration of Narrowband Interference Suppression
- Performance of Narrowband Interference Suppression

WCDMA Self Optimization Under Uplink Interference
- Description of WCDMA Self Optimization Under Uplink Interference

WCDMA Coverage Expansion Under Interference
- Description of WCDMA Coverage Expansion Under Interference

Duration

3 working days

Class Size

Min 6, Max 12