

LTE Overview

eLearning | Average Duration: 3.5 hours | Course Number: LTE_102

4G LTE

Long Term Evolution (LTE) is one of the choices for next generation broadband wireless networks and is defined by the 3GPP standards as an evolution to a variety of 3G wireless networks such as UMTS and 1xEV-DO. Its high data rates enable advanced multimedia applications. This eLearning course offers a quick and concise overview of LTE networks and the OFDM-based air interface. The LTE network architecture, network interfaces and protocols, air interface and mobility aspects are covered to provide an end-to-end view of the network. A high-level glimpse into the life of an LTE User Equipment (UE) is provided by walking through various stages from power-up all the way to setting up an IP address and exchanging traffic. By the conclusion of this course, the student will understand what LTE offers, its network architecture, how it works, and potential applications and services.

Intended Audience

This course is an end-to-end overview of LTE networks, and is targeted for a broad audience. This includes those in design, test, sales, marketing, system engineering and deployment groups.

Learning Objectives

After completing this course, the student 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

Course Outline

1. Setting the Stage

- 1.1. Introduction to LTE

2. LTE Network Architecture

- 2.1. Evolved Packet Core (EPC)
- 2.2. E-UTRAN - eNodeB
- 2.3. Network interfaces and protocol stacks

3. LTE Air Interface

- 3.1. OFDM/OFDMA radio concepts
- 3.2. SC-FDMA radio concepts
- 3.3. Radio transmission frame structures
- 3.4. Transport to physical channel mapping

4. LTE UE Operations

- 4.1. System acquisition
- 4.2. Idle mode operations
- 4.3. Initial access procedures
- 4.4. QoS
- 4.5. Registration and traffic

5. LTE Traffic Handling

- 5.1. Downlink traffic handling
- 5.2. Uplink traffic handling

6. LTE Mobility

- 6.1. Idle mode mobility
- 6.2. Active mode mobility / handover

7. Deployment

- 7.1. Typical LTE evolutionary path

8. Summary

Put It All Together

Assess the knowledge of the participant based on the objectives of the course