



AFRICAN ADVANCED LEVEL TELECOMMUNICATIONS INSTITUTE (AFRALTI)

## TRAINING WORKSHOP OUTLINE

<b>Title:</b>	<b>ICT for Non-Technical Staff</b>
<b>Dates:</b>	<b>29 Feb-4 Mar 2016</b>
<b>Venue:</b>	<b>Nyanga, Zimbabwe</b>
<b>Course Fee:</b>	<b>AFRALTI Members USD1,200, Non-Members USD1,440</b>

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### Course Overview:

This course provides a conceptual understanding of the architecture, leading technologies and operations of 2G/3G/4G wireless and converged IP networks. The course demystifies the terminology and acronyms commonly used in the wireless industry and helps in understanding the dependencies and interactions with other parts of the network. The course begins with a “Big Picture” of communications network. It then focuses on wireless technologies such as GSM/GPRS/UMTS/HSPA+, 1x/1xEV-DO, LTE, LTE-A and explains their operations and supported services. Participants will learn life of a mobile in a typical wireless network and the roles of various wireless network components and operations of services like SMS, MMS, Web browsing, VPN, email and others.

### Target Audience:

The course is for participants with little or no wireless knowledge. The diverse nature of this course makes it suitable for beginners in various organizations, including those in project management, sales, marketing, finance, system design, system test, systems and network engineering, product planning, management, support and operations.

### Pre-requisite/s:

A general understanding of ICT/telecommunications and Internet Protocol (IP) is recommended but not essential. A general understanding of wireless communications and networking will be an added advantage for the participants.

### Pain Points:

- Challenges in contributions to wireless technologies business.
- Understanding the wireless technologies functions
- Identifying and assessment of the appropriated wireless technologies
- Challenges of working in wireless technologies environments

## Value Proposition:

- To help Operators overcome their challenges wireless technologies requirements
- To enable Regulators adapt to existing and emerging wireless technologies
- To enhance the professional knowledge of Operators and Regulators to enable broadening of their skills in the complex evolution of wireless technologies

## Methodology:

Lectures, PowerPoint Presentations, Interactive Discussions, Cases Studies

## Workshop Objectives:

After completing this course, the participants will be able to:

- Sketch the wireless technology landscape from 1G to 4G
- Sketch the IP Convergence architecture
- Sketch the wireless network architecture
- Describe key features and benefits of CDMA (1x) and 1xEV-DO (Rev-0 & Rev-A)
- Describe key features and benefits of GSM/GPRS/UMTS/HSPA
- Explain how mobility works in Wireless networks
- Sketch the technology path for leading carriers in the world
- Explain the wireless network operations, including registration, call setup, call delivery and handovers
- Understand the Key Performance Indicators (KPIs) valuable to wireless service providers
- Sketch the VoIP and IMS architectures
- Show an end-to-end VoIP/IMS call scenario
- Identify the need and driving forces for 3.5G and 4G
- Discuss key building blocks of 4G technologies
- List the key characteristics of HSPA+, LTE and WiMAX
- Differentiate between CDMA, GSM, WCDMA and OFDMA
- Explain the various Fixed Mobile Convergence (FMC) options

## Workshop Learning Outcomes:

At the end of the five days training, participants will:

- ✓ Have understood the Wireless Technologies and IP Convergence.
- ✓ Have understood effective applications of wireless technologies and performance requirements.
- ✓ Be in a position to identify the impact of wireless technologies in their businesses
- ✓ Be in a position to contribute to the new plans and deployments of the wireless technologies.  
HSPA/LTE networks
- ✓ Be in a position to engage in valuation of wireless technologies projects.

## Workshop Contents/Topics:

1. Introduction
  - a. Wireless and IP Convergence
  - b. Wireless Technologies
  - c. Shift in business from 1G to 4G
  - d. IP convergence and FMC
  - e. Motivation

- f. Carrier and enterprise
- 2. Radio Network Basics**
  - a. Modulation
  - b. Propagation issues
  - c. FDMA
- 3. GSM/GPRS/EDGE/UMTS/HSPA**
  - a. Network architecture
  - b. Technology overview
  - c. Capabilities, benefits and challenges
  - d. Identities in GSM/GPRS and UMTS
  - e. SIM card and its benefits
  - f. Life of a mobile: Operations
    - i. Registration/location update
    - ii. Call Setup, Paging, Mobility
- 4. CDMA - 1x and 1xEV-DO Rev 0/Rev A**
  - a. Technology concepts
  - b. 1x and 1xEV-DO network architecture
  - c. Capabilities, benefits and challenges
  - d. Life of a mobile in 1x and 1xEV-DO
  - e. Mobile IP and roaming
- 5. Services in 3G networks**
  - a. Regulatory – E911, CALEA, etc.
  - b. SMS/EMS/MMS, etc.
  - c. 5.4. Enterprise Services - VPN, email
- 6. WiFi Essentials**
  - a. Evolution for 802.11 family
  - b. Capabilities, benefits and challenges
- 7. VoIP and IMS**
  - a. The service network competitors
    - i. IMS/MMD
    - ii. P2P (Skype, MS LCS, etc.)
  - b. Supporting technologies/protocols
    - i. SIP/H.323/Megaco/H.248
  - c. End - to - end call/session setup
- 8. LTE and 4G Networks**
  - a. LTE Network architecture
  - b. LTE Technology overview
  - c. Identities in LTE
  - d. Life of a UE: Operations
  - e. Registration/location update
  - f. Call Setup, Paging, Mobility
  - g. WiMAX
  - h. HSPA+
  - i. MIMO – What and why?
  - j. Deployment timelines and challenges

For more information, please contact us on

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