



## AFRICAN ADVANCED LEVEL TELECOMMUNICATIONS INSTITUTE (AFRALTI)

### COURSE OUTLINE

<b>Title:</b>	<b>Internet of Things and Cloud Computing</b>
<b>Duration:</b>	<b>10 Days</b>
<b>Date:</b>	<b>5<sup>th</sup>-16<sup>th</sup> November 2017</b>
<b>Venue:</b>	<b>Nairobi, Kenya</b>

#### OVERVIEW:

The Internet of Things (IoT) is the network of physical objects accessed through the Internet. These objects contain embedded technology to interact with internal states or the external environment. In other words, when objects can sense and communicate, it changes how and where decisions are made, and who makes them.

It is estimated that by the year 2020 there will be about 50 billion objects interacting with the physical world by way of sensors be they temperature, movement, frequency, humidity, light, sound, pressure, chemical properties, and many others. These smart digital devices will need to communicate over the Internet infrastructure with the people, collect data using the sensors, and respond to instructions and situations.

#### TARGET AUDIENCE:

This course is intended for professionals interested in gaining understanding of the new trends in the constantly changing ICT domain and their impact in business, namely, IT/IS Professionals, Business/Data Analysts, Project Managers, Business Development officers, Risk Management professionals, Internet Cloud Services professionals, Entrepreneurs, among others.

#### LEARNING OUTCOMES

- Understand the concepts of IoT and its impact on business & government organizations
- Understand the various components and architecture of IoT
- Understand the role of cloud computing (deployment and service models, architecture, private cloud infrastructural concerns, security and privacy concerns) in IoT
- Understand the role of data mining, business analytics and big data technologies in IoT
- Analyze and explore the security and privacy challenges in IoT

#### PRE-REQUISITES

Professional training and experience in the ICT domain and/or data or business analysis.

## **COURSE CONTENTS:**

### **1. Introduction to IoT**

- What is IoT?
- Effects of IoT
- Skill set for IoT
- Challenges and barriers to IoT
- Functional Requirements of IoT

### **2. Overview of IoT**

- Communication aspects involved in IoT system
  - Wired connectivity and technologies
  - Wireless connectivity and technologies
- Power and Energy Management & Optimization
- Network Topologies for IoT
- IoT Protocols
- IoT – Technologies & Software

### **3. Components & Elements of IoT**

- Components of IoT
- Elements of IoT
  - Radio Frequency Identification (RFID)
  - Wireless Sensor Networks (WSN)
  - Addressing schemes
  - Data, storage and analytics
  - Visualization
  - Security

### **4. Architecture of IoT system**

- Internet of Things—Architecture – IoT-A
- The IoT-A Reference Model
- Cloud Computing
  - Cloud Computing in Internet of Things
  - Internet of Things with Cloud Architecture
  - IoT-related Cloud Security Issues
  - IoT-related Cloud Computing Privacy Issues
  - Building a Private Cloud to enable IoT
- Business Analytics
  - Business Analytics in IoT Architecture
  - IoT and Data Mining
  - Data Warehouse in IoT
  - Data Visualization and Tools in IoT
  - Data Mining Tool
  - BA Techniques to empower IoT's Analytical & Decision Making Capability
- Big Data Technologies
  - Internet of Things and Big Data
  - The IoT Process and its challenges
  - Understanding Big Data
  - Hadoop and MapReduce
  - Apache HBase

### **5. Databases for IoT**

- Big Data turning into “HUGE DATA”

- SQL Databases
- NoSQL Databases
- Cloud Databases

#### **5. Mobile integration to enable IoT**

- Mobile Middleware
- Omni-Channel Retailing
- Mobile Loyalty
- Mobile Point of Sale
- Mobile Inventory
- Real World Mobile Integration Examples

#### **7. Security Aspects of IoT**

- IoT Security Aspects
- IoT features leading to security issues
- Security Issues in IoT based on RFID
- Design Considerations for IoT Technologies

#### **8. Privacy Aspects of IoT**

- Privacy Analysis
- Data Loss – RFID, Bluetooth, Big Data
- Mechanisms to Prevent Privacy Hack
- Popular Privacy Legislations
- Privacy Enhancing Technologies (PET)
- Approaches to IoT Privacy
- Practical tips to Handle IoT Privacy

#### **9. IoT Applications – Use Cases**

- Smart Cities
- Smart Environment
- eHealth
- Smart Agriculture
- Smart security and emergencies
- eHealth

**For more information, please contact us on**

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