

**Course Title**                    **From 2G to 4G LTE – How the cellular network operates**

**Duration**                         **2 Days**

**Course Overview**

The course completely dissects, disseminates and demystifies the end to end mobile cellular network voice and data operation. It delves into the 2G-4G network and builds upon each generation layer by layer ensuring you have an understanding of the relationships and interdependencies of each technology. The course is delivered in an easily understandable format using language and a style that ensures that even the most techno-phobic student will grasp.

**Delivery Method**

	Y/N		Y/N		Y/N		Y/N		Y/N
Classroom	y	Tutor Led	y	Webinar		Self-paced labs		Facilitated labs	y
Demonstrations	y	Case studies		Syndicate exercises	y	Self-paced		Lectures	

**Audience**

The course is aimed at people who are looking to get into the mobile telecommunications industry for employment and anybody already working in the telecommunications industry who needs to have a clear understanding and a high level overview of the cellular network system such as business managers, sales, business developers and project managers.

**Course Prerequisites**

There are no prerequisites for this course.

**Course Objectives**

**On completion of the course delegates will be able to:**

- Understand the electromagnetic radio frequency
- Explain frequency, wavelength and amplitude
- Understand the relationship between wavelength and frequency.
- Explain modulation and different modulation techniques.
- Understand GSM 2G and 3G Circuit Switched technology, network topology and functionality.
- Identify the elements associated with a cellular system along with the functions of each element.
- Explain the role of the SIM, handset and security measures in the mobile environment.
- Understand the basic LTE topology with emphasis on IP.
- Specify the correct antenna and suitable frequencies for specific roles or environments.
- Differentiate between different multiple access methods such as TDMA, FDMA, CDMA and OFDMA.

**Content Headings**

Course Introduction and Orientation  
 Introduction to the Electromagnetic Spectrum  
 An Introduction to Modulation  
 An Introduction to Modulation  
 An Introduction to Mobile Data  
 An Introduction to Long Term Evolution  
 Long Term Evolution User Equipment Considerations  
 The Role of Base Stations in Mobile Communications.  
 The role of SIM cards and handsets and their interaction with the mobile network.  
 GSM CS and PS Network Topology and end-to-end functionality.  
 GSM access methods and Air interface.  
 UMTS PS and CS Network Topology and end-to-end functionality.  
 UMTS Authentication and Security.  
 UMTS access methods and Air interface  
 Access methods TDMA, FDMA, CDMA and OFDMA