

هذا البرنامج التدريبي يقدم للمتدرب كل ما يحتاج أن يعرفه عن أنظمة الهوائيات المستخدمة في شبكات الاتصالات ويساعده في بناء قاعدة علمية صحيحة عن طبيعة عمل هذا الجزء الهام من منظومات الاتصالات المتنقلة وعن الحلول التي يساهم في تقديمها، وكذلك عن كيفية فحص وتقييم أداء عمل الهوائيات.

**Course Title:** Antennas For Mobile Networks  
**Course Reference:** ANT-02A  
**Level:** Introductory/Intermediate  
**Duration:** 5 days

**Description:**

The course gives a proper introduction to mobile cellular antennas and antenna systems, it helps in building a sound and robust knowledge on these important parts of the networks. This course enables the attendants to understand antenna systems as solution offerings and how can they be specified, tested and assessed.

**Course Objectives:**

Upon finishing this course the trainee will have:

- Understood the different bands of the frequency spectrum and how do they relate to each other when designing and building antennas.
- Known the propagation environment and who the performance of the antenna can accordingly be impacted.
- Been familiarised with antenna design approaches and associated matching techniques.
- Comprehended the role and the influence of each of the antenna design parameters.
- Understood the nature of the vertical and horizontal radiation patterns.
- Known who to specify the electrical, mechanical, and environmental parameters of cellular antennas for indoor and outdoor applications.
- Comprehended the nature of modern antenna structures and how operators can save money by selecting the right antenna/tower combination.
- Understood how antennas are checked and approved upon their delivery from suppliers.
- Known the new arrangements for master head amplifier (TMA)/integrated antennas.

ما يحصل عليه المتدرب بعد انتهاء فترة التدريب:

- فهم طبيعة تقسيم نطاق الترددات والعوامل التي تؤثر على مسار الموجات الراديوية.
- فهم مفصل لطبيعة التصميم المختلفة للهوائيات مع فهم كل مكون من المكونات التي تساهم في رفع مستوى أداء الهوائيات.
- التعرف على منظومات الهوائيات الحديثة وكيفية تشخيص خواصها وطرق فحصها وتقييم عملية أدائها.
- الفضات التي يمكن أن تستفاد من هذا المنهج التدريبي:
- المدرء ومدراء المشاريع.
- المهندسين.
- القينيين.
- رؤساء الفرق الفنية.
- فرق تخطيط الشبكة وقيلس أدائها.
- منفذي أعمال الشبكة.

**Who attends this course?**

- Engineers and technicians who are involved in specifying antennas to antenna suppliers
- Engineers and technicians who are involved in testing and vetting the performance of the received antennas from suppliers
- Engineers and technicians who have a direct contact with network deployment processes
- Team leaders
- Radio planners
- Network optimisation engineers and technicians
- Project managers
- Sub-contractors
- Managers who manage technical staff

**Accessories:**

All trainees will be supplied with "Wireless Domain Instruction Package" containing the complete course manual and CD for future reference to the course contents.

**Course Contents:**

- Frequency Spectrum
- Propagation environment in GSM and UMTS Bands
- Antenna Theory: Design considerations

- Antenna parameters and their importance for Cellular application  
Gain, VSWR, Vertical patterns, Horizontal patterns,  
Isolation between ports, Isolation between bands
- Mechanically tilted patterns
- Electrically tilted patterns
- Remotely tilted antenna patterns
- Antenna measurements (Gain, Return loss, Patterns, Isolation)
- On site antenna testing
- Dual Band antennas
- Tri-band antennas
- Tri-sector antennas
- Camouflaged Antennas
- MHA/TMA integrated antennas
- Antenna sites and towers
- Antennas for Indoor applications
- Antenna brackets and Fixtures
- How do you make sure that you order the right antenna?
- How do you make sure that you get the antenna which you requested?