

Radio Frequency Technology – 2 days

COURSE DESCRIPTION:

This course is designed for telecommunication and IT professionals wanting to understand the principles of radio frequency technology and to develop their knowledge of modern radio communication systems. The course will enhance the technical capability for your day-to-day work or your research program.

WHO SHOULD ATTEND:

ICT engineers, RF technicians, radio amateurs, military comms personnel, academics, telecommunication regulators, and people wanting a better knowledge of radio technologies

COURSE OBJECTIVES:

By attending the course, you are expected:

- To understand physics of radio waves, propagation, radio spectrum
- To understand RF technology, terminology, RF components and their characteristics
- To understand RF power, S-parameters, VSWR, transmission and reflection
- To understand antenna theory

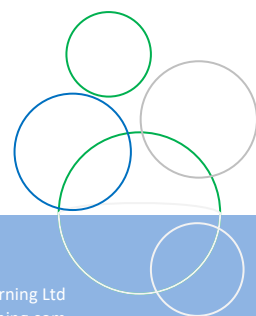
SOME COURSE BENEFITS:

- Have an understanding of RF technology
- Be able to operate, maintain and troubleshooting radio communication equipment
- Be able to measure a radio signal and its performance

FORMAT:

2 days, interactive classroom based or live online via Zoom

Maximum attendees 12 per course



CONTENT:

Day 1 Morning

- Radio Frequency – basic understanding
 - The RF unit dB, dBm, dBW – what are the meanings and how do we use them
 - Frequency, wavelength and bandwidth
 - Waveforms (Sine, Square), the conversion from time domain to frequency domain
 - Radio waves – transmission, reflection, propagation and polarization
 - Radio spectrum, HF, VHF, UHF, SHF, what are the use cases

Day 1 Afternoon

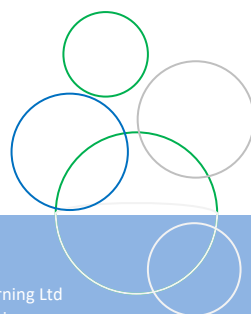
- Radio Parameters
 - Insertion loss and Return Loss
 - RF gain or loss
 - Modulation, noise & distortion, SNR, I/N
- Impedance – basic understanding
- Smith Charts and S-parameters
- RF Measurement

Day 2 Morning

- Antenna
 - Antenna parameters, gain, impedance, directivity, sidelobe etc.
 - Dipole Antenna, radiation pattern
 - Polarization, azimuth and elevation
 - Antenna array, radar antenna
 - Direction finding antenna

Day 2 Afternoon

- Modulation and Demodulation
 - AM, FM, and digital modulation (QAM, PSK, FSK, MFSK)
 - Frequency Hopping principles
 - RF Transmitter, power amplifier, modulator
 - RF receiver, LNA, mixer, demodulator, Analog to Digital converter
 - Filter and Duplexer
- RF non-linearity
 - Distortion
 - Intermodulation, adjacent channel leakage, blocking
 - Crosstalk
- RF Interference



Assessment (Optional for in-house courses)

- Instructor led interactive quizzes
- Multiple choice written test

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