



Excellent training, very good use of my time.



Watch our course intro video.

Introduction to Radio Concepts

Course Description

In this course the basic concepts of radio principles are introduced starting with an overview of the electromagnetic spectrum, with a primary focus on the area of radio communications. The course will progress and provide some basic radio communication terms and concepts before providing a focus on antennas used within radio communication systems. It will then finish off with an overview of the techniques utilised in modulation, duplexing and multiplexing.

This course has no prerequisites.

1 1/2 day
(LiveOnsite,
LiveOnline)

3 hours
learning
(OnlineAnytime)

3

CPD Learning
Credits



Level: 1
(Beginner)

This course will contain the following sections:

1. Introduction to Radio Concepts

Topic areas covered include:

- The Electromagnetic Spectrum.
 - Frequencies of RF Communication:
 - Licensed and Unlicensed.
 - mmWave.
 - Regulations:
 - Interference and Power.
- RF Fundamentals:
 - Waveform Fundamentals.
 - The Fundamentals of Propagation.
 - Frequency, Wavelength and Velocity.
- Decibel Basics:
 - dB Variants (dBi, dBm).
 - Link Budget Calculation.
- Antennas – Part 1:
 - Antenna types, gains and radiation patterns:
 - Dipole.
 - Yagi.
 - Patch.
 - Parabolic Reflector.
- Antennas – Part 2:
 - Microwave.
 - MIMO.
 - Adaptive Antennas and Beamforming.
 - Massive MIMO.
- Modulation Techniques:
 - AM, FM, Phase.
 - QPSK, 16QAM, 64QAM, 256QAM.
- Duplexing and Multiplexing Techniques:
 - Simplex, half duplex and full duplex.
 - FDD and TDD.
 - FDMA, TDMA, CDMA.
 - OFDMA.



**Watch a Sample
Video Online**

1/2 day
(LiveOnsite,
LiveOnline)

3 hours
learning
(OnlineAnytime)

3

**CPD Learning
Credits**



**LiveOnsite, LiveOnline,
OnlineAnytime**



ENTERPRISE

Need to train a large group?

mpirical.com/enterprise



TEAM

Training for a team?

mpirical.com/team-training



INDIVIDUAL

Looking for yourself?

mpirical.com/individual-training

Managed Learning Services

As part of our managed learning service we can offer you and your organisation a full range of services including:

mpirical.com/about-us/managed-learning-services

- Bespoke content and courseware development.
- Product specific training packages, including product updates.
- Dedicated trainers to understand your products and training requirements.
- Managed training delivery services – administrative aspects including scheduling and liaison.
- Customizable learning management system.
- Traditional classroom, virtual classroom or video based online learning options.

NetX

The Mpirical Network Visualisation Solution: **NetX Bringing Telecoms to Life!**
Imagine the benefits of having an entire mobile network available from your desktop.

- Where you can view a complete network map.
- Watch call flows across the network.
- Investigate network procedures.

NetX does this... and even more with our NetX customization options!
NetX is not just a learning aid, it is a valuable resource in the day to day activities of any telecoms professional and has been spotlighted as such by the 3GPP.

Explore NetX further at www.mpirical.com/netx



+44(0)1524 844669



enquiries@mpirical.com

www.mpirical.com