

Training programme: Basic concepts in RF Engineering

Tailored for practical engineers and electronics engineers who are not RF experts

Introduction

“Basic Concepts in RF Engineering” is a 24 study-hours course tailored to provide basic concepts in RF, such as: Noise budget, Non-linearity effects, RF chain architecture and RF Test equipment basics and operation. The training is aimed at enhancing the knowledge of measurements technicians and engineers in the fields of RF and microwave.

The course includes theoretical studies combined with practical demonstrations, with the latest modern up-to-date test equipment. Training materials include: full theoretical notes and classroom exercises.

Short Form Syllabus with Suggested Time Allocations

Content	Time allocated
1.1 Introduction to RF communications: The electromagnetic spectrum, the concept of wavelength, the logarithmic language of the decibel, reading antenna patterns and line-of-sight link-budget	2 hours
1.2 The concepts of thermal noise, noise figure, receiver sensitivity, signal to noise ratio, noise measurements	Day 1 3 hours
1.3 The concepts of non-linearity effects and dynamic range in RF chains and systems, IP2/3, P1dB C.P., total harmonics distortion	3 hours
2.1 Basic RF building blocks: Filters, amplifiers, mixers, couplers, attenuators, splitters	Day 2 3 hours
2.2 RF chain architectures: Receiver architectures, heterodyne and zero-IF	5 hours
3.1 RF measurements - the spectrum analyser: Block diagram, basic measurements, the resolution and video filters, sensitivity and noise floor, dynamic range and linearity aspects. ** To be physically demonstrated **	3 hours
3.2 RF measurements - The network analyser: Block diagram, basic measurements, S-parameters, transmission vs. reflection measurements, calibration. ** To be physically demonstrated **	Day 3 3 hours
3.3 RF measurements - signal generators: Block diagram, basic structure of a synthesizer, specifications of signal generators, the concept of phase noise and its influence on signal purity.	2 hours
Total study duration	24 Hours

Target audience

The target audience for this seminar consists of technicians, practical engineers and engineers who are not RF experts, who wish to accurately characterise test set-ups, and better understand the theory and operation of RF systems and test set-ups.

Presenter

The seminar will be presented by **Mr. Itamar Shachar**, RF Engineer.

For a full BIO, please follow the link - <https://www.linkedin.com/in/itamar-shachar-015096a5/>

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