RF fundamentals Training

BILGINC
IT Academy
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Duration: **2 Day**

Radio Frequency engineering is an important yet often overlooked area in today's wireless world. This course provides a grounding in RF theory and practice for wireless, cellular and microwave systems.

Prerequisites

None.

What You Will Learn

By the end of the course delegates will be able to:

- Explain the basics of RF.
- Describe RF propagation and antenna principles.
- Calculate propagation losses and link budgets.
- Test RF systems.

Training Outline

What is RF?

Definition of RF, RF wave characteristics: Frequency, wavelength, power, phase, impedance, RF history, radio signals, frequency bands, safety issues, legal issues.

RF systems

Microwaves, cellular/mobile RF, WLANs, other fixed wireless networks, basic RF components.

Building a basic WLAN network.

RF system components

Transmitters: Antennas: Isotropic, Dipole, how antennas achieve gain.

Modulation

Schemes, bandwidth, AM, FM, FSK, PSK, QAM, QPSK, interference, performance.

Interference and performance.

Multiple access schemes

FDMA, CDMA, TDMA, CSMA/CA.

Wireless systems

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Cellular (GSM, UMTS), Wifi, WiMax, others: GPS, DBS, RFID, radar, Bluetooth.

cellular.

Spread Spectrum technologies

Spread spectrum benefits and disadvantages, how it works, Direct Sequence, Frequency Hopping, hybrids.

RF propagation

Models, link budget, Smith chart, RF matching with the Smith chart. cell capacity, tradeoffs: power vs. bandwidth, free space, reflection, diffraction, multipath cancellation, propagation prediction and measurement tools.

Smith charts.

RF testing

Why power rather than voltage/current, units of power, dB and dBm power conversions. Test equipment: signal generators, power meters, network analysers, spectrum analysers. RF test setups: return loss, insertion loss.

RF testing.