



RF and Wireless Fundamentals

Course Outlines

- **Basic Radio and RF Concepts**
 - RF Energy
 - RF Generation, Transmission, and Reception
 - Oscillators and Power Amplifiers
 - dB and dBm power conversions
 - Digital Modulation of RF Signals
 - Amplitude, Frequency Modulation, QAM & QPSK
 - Filtering
 - Equalizers
 - Multiple Access Techniques
 - TDMA, FDMA, CDMA
 - OFDM, W-OFDM, SOFDM
 - Duplexing, TDD vs. FDD
 - Channel Coding
 - Spread-Spectrum Modulation
- **RF Propagation Principals**
 - Path / Propagation Losses
 - Fading
 - Fade Margin and Fresnel Zone
 - Link Budgets
 - Receiver Sensitivity
 - Noise Figure
 - Guard Band
 - BER vs. Noise
 - Link Budget and High Level System Design
 - Sample Link Budget Calculations
- **Antennas**
 - Antennas Basics
 - Effective Radiated Power (ERP)
 - Directivity and Gain Antenna Types
 - Antenna Radiation Patterns
 - Polarization
 - Diversity Antenna Systems
 - MIMO Antenna Systems
- **RF System Planning**
 - Wireless Topologies PTP and PMP
 - LOS, NrLOS, NLOS
 - Licensed & Unlicensed Frequency Bands
 - Frequency Planning
 - Frequency Reuse
 - RF Site Survey
 - RF Site Survey Tools

Who Should Attend

This course is designed for anyone needing a solid foundation for understanding the principles of RF and Wireless Engineering. Engineers, technicians and managers who are new to RF and Broadband Wireless (WiFi & WiMAX) requiring applicable skills in RF design, planning and engineering. Anyone working within the field of general RF systems, wireless, cellular and microwave systems will benefit from this comprehensive coverage of RF fundamentals. Basic mathematical and computing skills are recommended for this course. An electrical or computer engineering background or equivalent practical experience is desired but not required.

Course length: 4 Days

Prerequisites: None

Get Certified



WiMAX & EION Certified Wireless Engineer

Move your career ahead by distinguishing yourself in the wireless industry with EION/Wi-LAN professional certification

Certification Courses – First TWO courses are required for WiMAX Essentials Wireless Engineer Certificate

1. RF and Wireless Fundamentals
2. WiMAX Fundamentals
3. WiMAX RF Planning, Network Design, & Implementation
4. 802.16e Mobile WiMAX Fundamentals

EION Product Specific Courses – Each Course qualify for EION Wireless Engineer Certificate

1. Libra MAX Network Design, Installation, & Troubleshooting
2. Libra 5800 Network Design, Installation, & Troubleshooting
3. Ultima3 Network Design, Installation, & Troubleshooting
4. VIP 110-24 Network Design, Installation, & Troubleshooting
5. Ranger 5145 Network Design, Installation, & Troubleshooting