RF & Wireless Fundamentals

Essentials Certificate Training

Course Code:

ECT 100

Prerequisites:

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.

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.

Course Outline:

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, SOFDMA
- Duplexing, TDD vs. FDD
- Channel Coding
- Spread-Spectrum Modulation

RF Propagation Principals

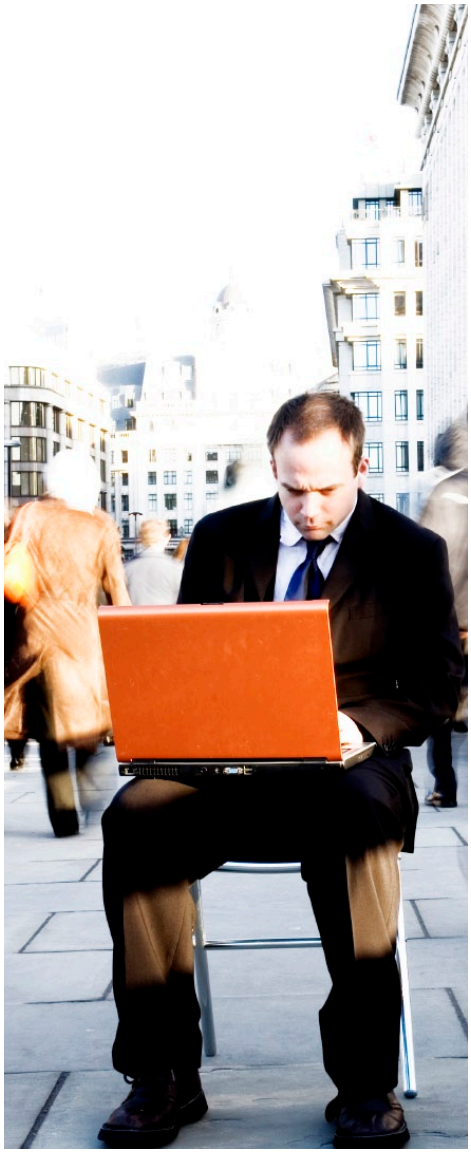
- Path / Propagation Losses
- Fading
- Fade Margin and Fresnel Zone
- Link Budgets
- Receiver Sensitivity
- Noise Figure
- Guard Band
- BER vs. Noise
- Link Budget and High Level System Design
- Sample Link Budget Calculations

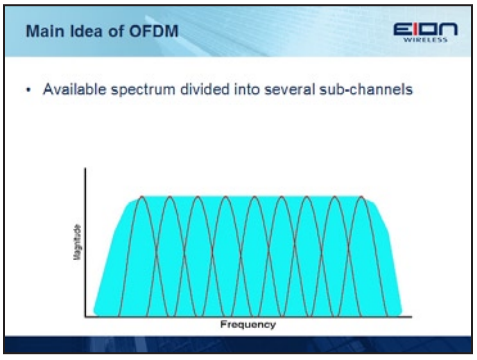
Antennas

- 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





About EION Wireless:

EION's Broadband Wireless portfolio delivers last-mile wireless and WiMAX solutions for enterprises, service providers, defense agencies, security agencies, and remote communities. A wide range of point-to-point and point-to-multipoint radio systems, coupled with robust and scalable broadband gateways enable multiple applications to be supported and deployed.

EION's combination of carrier class IP experience, wireless networking skills, and security expertise bring highly reliable and secure communications solutions to its clients. From isolated and inaccessible villages to congested and challenging urban environments, EION builds the equipment and designs the solutions that make it all possible - a powerful combination of wireless broadband and scalable wireless communications systems.

About the Instructors:

Dr. Waleed Hosny is a Research Analyst in Computing and Systems Technologies at the Electronics Research Institute of Cairo, Egypt. Waleed's research areas are in Wireless Communications and IP Mobility. He holds B.Sc., M.Sc., and PhD in Communications Engineering from Cairo University of Egypt.

Waleed is an active member of the IEEE (Institute of Electrical and Electronics Engineers) Association since 1999 and published many papers in international journals and magazines. He has been involved with Telecommunications and Information Technology since 1994. Waleed has held several senior management positions and Consultancy roles for many major private and public sector corporations and to many USAID projects in Egypt in the areas of data and voice networks, and Internet/ Intranet. Waleed has several years of project management experience working with diversified, cross functional teams.

Dr. Anand Srinivasan is the Vice President Technology & Product Development at EION Wireless. With over 15 years of experience in system design and network planning for large scale wired and wireless networks Dr. Srinivasan is the principal architect developing EION's innovative mobile Ad Hoc networking technology, wireless back haul systems and award winning WiMAX product line.

Dr. Srinivasan holds a Ph.D and M.Sc. in computer science from the University of Victoria, British Columbia, Canada. He has published over fifty papers in the areas of operating systems, distributed systems, fault-tolerance, wireless networks and optimization and holds four patents.

Testimonials:

"The WiMAX training was very well done, especially the instructor. We were given information of WiMAX Fundamentals and experienced thorough practice work. We are really thankful and appreciate the time it took to teach us."

- Ahmad Wali Khan, Noc Manager, Afghan Telecom Ltd. & MCIT

"I loved it... I am looking forward to know more about your products... we want to develop this relationship and partnership in Africa."

- Sales Manager, NetvSat Communications

"Exellent, informative, good level of details, good demos, labs, and overall interaction. The experiments with the management tool were excellent and beneficial!"

- Kassem M. Adballah, BroadBand Wireless Access Support Manager, DU

"The course content has been instructive, informative and it is more interesting with the practical underground presentation of the course. The instructor has been very good and has presented the course excellently. The environment is excellent for the course and the logistics are good."

- Raphael Faseun, Network Engineer, DCC Satellite and Networks

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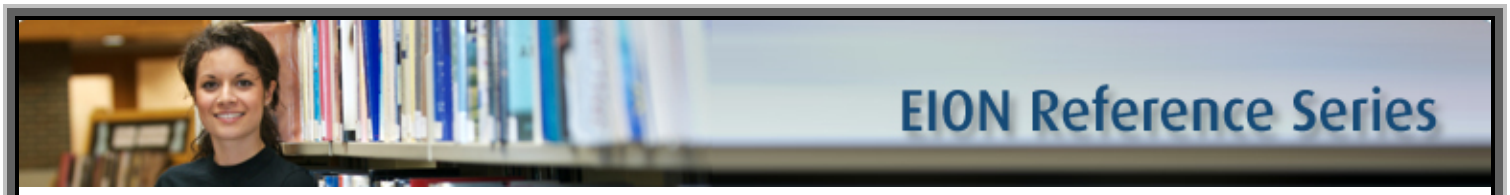
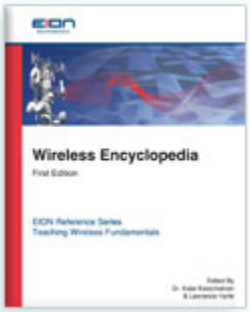
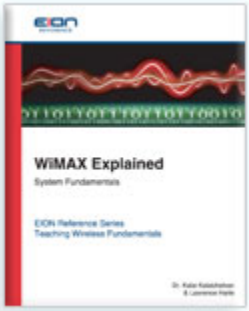


Your Guide to Understanding Today's Wireless World!



Wireless Encyclopedia

EION collaborated with 12 wireless, voice, data and video experts; each with specific knowledge of wireless telecom technologies and business practices to produce this Wireless Encyclopedia. This team together with input from over 1,025 other contributors gathered, added, and edited what are now the latest wireless, telecom, data network terms in use today.



WiMAX Explained

Come and explore WiMAX from the inside out. This book examines the inner workings of WiMAX as well as the myriad of business applications available. *WiMAX Explained* is the perfect companion for the businessperson, engineer or layperson looking for a basic introduction to WiMAX and the 802.16 standard.

From wireless technology basics to complex marketplace analysis, everything is explained in these illustrated texts. Make informed decisions by learning from the experience of seasoned professionals in the wireless industry.

Find out more about the EION Reference Series at;

www.eionreference.com