



## Fundamentals of **WiMAX**

### ❖ Course Objectives

- To discuss the basics of wireless communications.
- To discuss the basics of computer networks.
- To study the basics of WiFi networks.
- To study the basics of WiMAX networks.
- To simulate WiMAX networks.
- To implement WiMAX networks.

### ❖ Type of Delivery

Instructor-Led Training

### ❖ Duration

5 Weeks – 3 Sessions per week  
3 hours/ Session

### ❖ Training Benefits

- Professional Instructor
- Professional Presentations
- Software Simulation
- Software Emulation
- Exam & Final Project
- CEUs certificate for Professional Engineers
- Special discount for IEEE members
- Internationally recognized certificate

❖ **A few of the covered topics are**

- Evolution of Broadband Wireless
- Narrowband Wireless Local-Loop Systems
- First-Generation Broadband Systems
- Fixed Broadband Wireless
- Mobile Broadband Wireless
- Background on IEEE 802.16 and WiMAX
- Salient Features of WiMAX
- WiMAX Radios
- WiMAX Antennas
- Omni Directional Antenna
- Sector Antennas
- Subscriber Stations
- WiMAX Standards
- WiMAX Physical Layer
- Channel Coding
- Block Turbo Codes and LDPC Codes
- Hybrid-ARQ
- Symbol Mapping
- Subchannel and Subcarrier Permutations
- Downlink Partial Usage of Subcarriers
- Band Adaptive Modulation and Coding
- Slot and Frame Structure
- Closed-Loop MIMO
- WiMAX MAC Layer
- Packet Header Suppression
- MAC common-part sublayer
- WIMAX simulator block diagram
- PHYSICAL in MATLAB simulink
- VHDL: Overview
- Programmable Array Logic
- FPGA: An Overview
- OFDM Implementation

*Please refer to course catalogue to see full covered topics.*

### ❖ Target Audiences

This course is Suitable for Communications Engineering students at level 3 and 4 and newly admitted engineers. It is suitable also for Computer Engineering students at level 3 or 4 or newly admitted engineers.

### ❖ Prerequisites

- Analog Communications.
- Digital Communications.
- Basics of Computer Networks.
- Matlab Fundamentals

### ❖ Course certification

Upon successfully completing course assessment, quizzes, final project and exam, you will be eligible to get your internationally recognized certificate. This course is offering CEUs from IEEE and IACET for more information: [www.ieee.org/partners](http://www.ieee.org/partners)

### ❖ About the Instructor

This course is delivered by **Dr. Mohamed Abdel Azim**. He is currently an assistance professor at Mansoura University. He has wide experience of teaching Electronics and Communications Engineering courses in various Universities in Egypt.

<http://mansvu.mans.edu.eg/cv/en/showcv.php?id=5063>

### ❖ Course References

- Frank Ohrtman, “WiMAX Handbook” McGraw Hill, 2005.
- Jeffery G. Andrews, Arunabha Ghosh, and Rias Muhamed, “Fundamentals of WiMAX Understanding Broadband Wireless Networking,” Prentice Hall, 2009.
- Mohammad Azizul Hasan “Performance Evaluation of WiMAX/IEEE 802.16 OFDM Physical Layer,” 2007.