

FIXED AND MOBILE WiMAX ©

This is a 2 day in depth technical course intended to give students a solid understanding of WiMAX, how it works and deployment considerations. The course is divided into five distinct modules.

1. WiMAX Market Opportunities and Spectrum Considerations
2. WiMAX Standards Evolution
3. 802.16 Physical Layers
4. 802.16 Medium Access Control Layer
5. 802.16 Security Sub-layer

Objectives:

This is a 2 day technical training class on the IEEE 802.16 standard generally referred to as WiMAX. At the end of this course the student should be able to:

- Understand the services provided by WiMAX
- List the major strengths of the OFDMA air interface and understand why this has become the air interface of choice for broadband communications
- Describe the different WiMAX physical layers
- Define the major functions and operational procedures of WiMAX
- Explain the major enhancements to WiMAX currently under definition
- Discuss how WiMAX can be considered complementary or competitive to other broadband technologies, such as, 3G and Wi-Fi

Who Should Attend:

This course will benefit any one who will work with WiMAX, including technical support and product development.

Course Prerequisites:

There are no prerequisite requirements to attend this course, although a background in telecommunications and / or wireless communications would be advantageous.

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Module 1: WiMAX Market Opportunities and Spectrum Considerations

By the end of this module, course attendees will be able to:

- Be aware of the major applications and market opportunities for WiMAX
- Discuss the major benefits of WiMAX
- Describe the current status of WiMAX
- Understand the current licensing and regulatory issues concerning WiMAX

Content:

- Wireless Broadband Applications and Services
- Contrasting Wireless Broadband Technologies
- WiMAX Market Status
- Spectrum Considerations
- Module Summary

Module 2: WiMAX Standards Evolution within IEEE and WiMAX Forum

By the end of this module, course attendees will be able to:

- Describe the IEEE 802 working groups and its standards process
- Explain the key differences between the major 802 wireless standards
- Define the key components & terms of WiMAX networks
- Understand the role & activities of the WiMAX Forum

Content:

- IEEE 802 Standards Process
- IEEE 802 Family of Standards
- Overview of WiMAX
- 802.16 Standards Evolution
- WiMAX Forum
- Module Summary

Module 3: WiMAX Physical Layers

By the end of this module, course attendees will be able to:

- Explain the key aspects of the OFDM and OFDMA air interface
- Discuss the advantage of OFDM over other air interfaces
- List the different 802.16 Physical Layer options
- Describe the major components of an OFDM transmitter
- Understanding how subcarriers and subchannels are allocated in 802.16

Content:

- Orthogonal Frequency Division Multiplexing (OFDM)
- Advantages of OFDM
- 802.16-2004 and 802.16e-2005 Physical Layers
- Key Aspects of an OFDM Radio
- Allocation of OFDM Subcarriers
- Module Summary

Module 4: 802.16 Medium Access Control Layer

By the end of this module, course attendees will be able to:

- Explain the different types of connections in 802.16 and how QoS is enabled
- Describe how a MAC PDU is constructed and transmitted on the PHY layer
- Define how a Subscriber Station connects to an 802.16 network
- Describe how a Subscriber Station makes bandwidth requests
- Understand the handover and power control capabilities of 802.16e-2005

Content:

- MAC Connections and Provisioning of QoS Services
- MAC Frame Structure
- MAC Packet Data Unit (MPDU)
- MAC Operational Procedures
- 802.16e-2005 Procedures to Support Mobility
- Module Summary

Module 5: 802.16 Security Sub-Layer

By the end of this module, course attendees will be able to:

- Describe the major components of the 802.16 security sublayer
- Understand the 802.16e-2005 security enhancements required to support mobility

Content:

- WiMAX Security
- Privacy Key Management
- Data Encryption
- 02.16e Security Enhancements to Support Mobility
- Module Summary