

Course Title: Wireless Communications

Course Code: ETEG 432

Credit Hours: 3

Course Description:

This course intends to provide the fundamental theory, technical issues and design aspects associated with high capacity wireless communications systems.

Course Contents:

Unit 1: Overview of Wireless Communications, Wireless Systems and Standards (1G/2G/3G Systems)

Unit 2: Cellular System Design Fundamentals

Cellular concept, Frequency reuse, Trunking, GOS, Cell-Splitting, Sectoring, SIR

Unit 3: Wireless Channel Models

Path Loss and Shadowing Models, Statistical Fading Models, Narrowband Fading, Wideband Fading Models

Unit 4: Wireless Techniques and their Performance

Capacity of Wireless Channels, Digital Modulation and its Performance, Multiple access schemes (FDMA, TDMA, CDMA), Diversity

Unit 5: Adaptive Modulation

Practical Considerations in Adaptive Modulation, Multiple Input/Output (MIMO) Systems, Equalization, Adaptive Equalization, Multicarrier Modulation and OFDM, Spread Spectrum, CDMA, Multiuser Systems, Smart Antennas, Software Radio

Unit 6: Introduction Wireless Networks

Unit 7: Wireless Communications as Applied to Cellular Mobile Communications

References:

1. Theodore S. Rappaport, *Wireless Communications: Principles & Practice*, Prentice Hall
2. Andrea Goldsmith, *Wireless Communications*, Cambridge University Press.
3. Jon W. Mark and Wihua Zhuang, *Wireless Communications and Networking*, PHI 2005.