

ECE 442
Wireless Communications

Syllabus:

- **History of wireless communications, Introduction to wireless communication systems, examples of mobile radio systems, cellular communications and PCS.**
- **Wireless channel, Mobile radio propagation, large- and small-scale path losses, Reflection, diffraction, scattering, models of propagation, multi-path models.**
- **Information sources and A/D conversion**
- **Digital modulation techniques, pulse shaping techniques, spread spectrum modulation techniques.**
- **Radio spectrum and frequency allocation**
- **Cellular systems, frequency reuse, channel assignment, interference and system capacity.**
- **Receivers and diversity reception techniques.**
- **Multiple-access techniques, FDMA, TDMA, and CDMA. Capacity and power control.**
- **Random-access protocols**
- **Current and emerging wireless systems and standards, cellular telephony (AMPS, GSM, CDMA IS95), cordless phones, wireless local loop (WLL), wireless local area networks (WLAN and WiFi), Wireless personal digital assistants (PDAs), pagers, mobile satellite services (MSS), GPS and E-911 wireless geo-location services, 3G/4G and beyond (WCDMA, cdma200), Bluetooth, WiMAX, and Wireless sensor networks.**

Table I: Objectives

Objectives		A	B	C	D	E	F	G	H	I	J	K
O ₁	Understand wireless radio propagation	X			X						X	
O ₂	Understand impact of wireless channels on digital modulations	X				X						
O ₃	Understand the fundamental of spread spectrum	X				X						X
O ₄	Understand the foundations of multiple access techniques	X		X		X						X
O ₅	Understand the trade-offs in wireless systems	X		X		X					X	X