

EE 670 Wireless Communications

1. Wireless Communications and Diversity (8 Lectures)
A. Wireless Channel Modeling
B. Path loss, Shadowing
C. Fast Fading
D. Rayleigh/Ricean Fading Channels
E. BER Performance
F. Diversity
G. BER Performance with diversity
H. Types of Diversity
I. WSSUS Channel Modeling
J. RMS Delay Spread
K. Doppler Fading
L. Jakes Model, Autocorrelation
M. Jakes Spectrum
N. Impact of Doppler Fading
2. Cellular Communications (5 Lectures)
A. Introduction to Cellular Communications
B. Frequency reuse
C. Multiple Access Technologies
D. Cellular Processes - Call Setup, Handover etc.
E. Teletraffic Theory
3. CDMA (5 Lectures)
A. Introduction to CDMA
B. Walsh codes, Variable tree OVSF
C. PN Sequences
D. Multipath diversity, RAKE Receiver
E. CDMA Receiver Synchronization
4. OFDM (5 Lectures)
A. Introduction to OFDM
B. Multicarrier Modulation and Cyclic Prefix
C. Channel model and SNR performance
D. OFDM Issues – PAPR
E. Frequency Offset
5. MIMO (8 Lectures)
A. Introduction to MIMO
B. MIMO Channel Capacity
C. SVD and Eigenmodes of the MIMO Channel
D. MIMO Spatial Multiplexing – BLAST

E. MIMO Diversity – Alamouti, OSTBC
F. MIMO Beamforming – MRT
G. MIMO - OFDM
6. Wireless Standards (4 Lectures)
A. GSM
B. WCDMA
7. Invited Lectures (5 Lectures)
A. LTE
B. IS 95
C. Wireless Networks
D. Video over Wireless