

KL University
Department of Electronics & Computer Engineering
M.Tech (wcsn) First Semester 2015-2017

Course Code : 15-EM5110
Course Title : **Wireless Communication**
Course Structure : 3-0-2
Credits : 4

SYLLABUS:

Unit 1

Cellular Concepts – System Design Fundamentals Cellular concept-channel reuse- handoff strategies-dynamic resource allocation-interference and system capacity-improving capacity and coverage of cellular systems. Second and third generation network standards: GSM standardization-architecture and function partitioning-GSM radio aspects-security aspects-protocol model-call flow sequences-evolution to 2.5G mobile radio networks. IS-95 service and radio aspects, key features of IS-95 CDMA systemsECWDMA-UMTS physical layer-UMTS network architecture-CDMA 2000 physical layer.

Unit 2

Radio Wave Propagation Free space propagation model- basic propagation mechanisms – reflection- ground reflection model diffraction-scattering-practical link budget design-outdoor and indoor propagation models.

Unit 3

Capacity of Wireless Channels Capacity of Flat Fading Channel- Channel Distribution Information known – Channel Side Information at Receiver – Channel Side Information at Transmitter and Receiver – Capacity with Receiver diversity – Capacity comparisons – Capacity of Frequency Selective Fading channels.

Unit 4

Diversity Realization of Independent Fading Paths – Receiver Diversity – Selection Combining – Threshold Combining – Maximal-Ratio Combining – Equal - Gain Combining – Transmitter Diversity – Channel known at Transmitter – Channel unknown at Transmitter – The Alamouti Scheme-basic concepts of RAKE receivers.

Unit 5

Multiple Access Techniques Frequency division multiple access-time division multiple access-spread spectrum multiples access space division multiple access- packet radio. MIMO and multicarrier modulation: Narrowband MIMO model-parallel decomposition of MIMO channel-MIMO channel capacity-MIMO diversity gain.

Text Books:

1. Andrea Goldsmith, “Wireless Communications,” Cambridge University Press, 2005
2. T.S. Rappaport, “Wireless Communications,” Pearson Education, 2003

Reference Books:

1. Raj Pandya, “Mobile and Personal Communication Systems and Services,” Prentice Hall of India, 2002
2. William C.Y. Lee, “Wireless and Cellular Telecommunications,” Third edition, Mc. Graw Hill, 2006.