EC8652   **WIRELESS COMMUNICATION**   **L T P C**
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OBJECTIVES:
- To study the characteristic of wireless channel
- To understand the design of a cellular system
- To study the various digital signaling techniques and multipath mitigation techniques
- To understand the concepts of multiple antenna techniques

UNIT I WIRELESS CHANNELS   **9**
Large scale path loss –Path loss models: Free Space and Two-Ray models -Link Budget design –Small scale fading-Parameters of mobile multipath channels –Time dispersion parameters-Coherence bandwidth –Doppler spread & Coherence time, fading due to Multipath time delay spread –flat fading –frequency selective fading –Fading due to Doppler spread –fast fading –slow fading.

UNIT II   **CELLULAR ARCHITECTURE**   **9**
Multiple Access techniques -FDMA, TDMA, CDMA –Capacity calculations–Cellular concept-Frequency reuse -channel assignment-hand off-interference & system capacity-trunking & grade of service –Coverage and capacity improvement.

UNIT III   **DIGITAL SIGNALING FOR FADING CHANNELS**   **9**
Structure of a wireless communication link, Principles of Offset-QPSK, p/4-DQPSK, Minimum Shift Keying, Gaussian Minimum Shift Keying, Error performance in fading channels, OFDM principle –Cyclic prefix, Windowing, PAPR.

UNIT IV   **MULTIPATH MITIGATION TECHNIQUES**   **9**
Equalisation –Adaptive equalization, Linear and Non-Linear equalization, Zero forcing and LMS Algorithms. Diversity –Micro and Macro diversity, Diversity combining techniques, Error probability in fading channels with diversity reception, Rake receiver.

UNIT V   **MULTIPLE ANTENNA TECHNIQUES**   **9**
MIMO systems –spatial multiplexing -System model -Pre-coding -Beam forming -transmitter diversity, receiver diversity-Channel state information-capacity in fading and non-fading channels.

                                                                             TOTAL:45 PERIODS

OUTCOMES:
The student should be able to:
1. Characterize a wireless channel and evolve the system design specifications
2. Design a cellular system based on resource availability and traffic demands
3. Identify suitable signaling and multipath mitigation techniques for the wireless channel and system under consideration.

TEXT BOOKS:
1. Rappaport,T.S., ―Wireless communications‖, Pearson Education, Second Edition, 2010.(UNIT I, II, IV)
2. Andreas.F. Molisch, ―Wireless Communications‖, John Wiley –India, 2006. (UNIT III,V)

REFERENCES:
1. Wireless Communication –Andrea Goldsmith, Cambridge University Press, 2011
2. Van Nee, R. and Ramji Prasad, ―OFDM for wireless multimedia communications, Artech House, 2000
3. David Tse and Pramod Viswanath, ―Fundamentals of Wireless Communication, Cambridge University Press, 2005.
4. Upena Dalal, ―Wireless Communication‖, Oxford University Press, 2009.