WIRELESS COMMUNICATIONS
(Professional Elective-VI)

Course Code : 15IT1106

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Course Outcomes:

At the end of the Course, the Student will be able to:

CO 1 Learn fundamental cellular radio concepts.

CO 2 Know different ways to radio propagation models.

CO 3 Discuss analog and digital modulation techniques in wireless communication.

CO 4 Learn different types of equalization techniques and diversity concepts.

CO 5 Explain transceiver schemes, second and third generation wireless networks.

UNIT I (10 Lectures)

SERVICES AND TECHNICAL CHALLENGES:

Types of Services, Requirements for the services, Multipath propagation, Spectrum Limitations, Noise and Interference limited systems, Principles of Cellular networks, Multiple Access Schemes.

UNIT II (10 Lectures)

WIRELESS PROPAGATION CHANNELS:

Propagation Mechanisms (Qualitative treatment), Propagation effects with mobile radio, Channel Classification, Link calculations, Narrowband and Wideband models.

UNIT III (10 Lectures)

WIRELESS TRANSCEIVERS:

Structure of a wireless communication link, Modulation and demodulation – Quadrature Phase Shift Keying, ?/4-Differential

Quadrature Phase Shift Keying, Offset-Quadrature Phase Shift Keying, Binary Frequency Shift Keying, Minimum Shift Keying, Gaussian Minimum Shift Keying, Power spectrum and Error performance in fading channels.

UNIT IV (10 Lectures)

SIGNAL PROCESSING IN WIRELESS SYSTEMS:

Principle of Diversity, Micro diversity, Signal Combining Techniques, Transmit diversity, Equalisers- Linear and Decision Feedback equalisers, Review of Channel coding and Speech coding techniques.

UNIT V (10 Lectures)

ADVANCED TRANSCEIVER SCHEMES:

Spread Spectrum Systems- Cellular Code Division Multiple Access Systems- Principle, Power control, Effects of multipath propagation on Code Division Multiple Access, Orthogonal Frequency Division Multiplexing – Principle, Cyclic Prefix, Transceiver implementation, Second Generation(GSM, IS–95) and Third Generation Wireless Networks and Standards

TEXT BOOKS:

1. Andreas.F.Molisch, “Wireless Communications”, John Wiley–India, 1st Edition, 2006.
2. Simon Haykin & Michael Moher, “Modern Wireless Communications”, Pearson Education,1st Edition, 2007.

REFERENCES:

1. Rappaport.T.S.,”Wireless Communications”, Pearson Education, 1st Edition, 2003.
2. GordonL.Stuber, ”Principles of Mobile Communication”, Springer International Ltd., 1st Edition, 2001.
3. AndreaGoldsmith, “WirelessCommunications”,Cambridge UniversityPress, 1st Edition, 2007.