Devi Ahilya University, Indore, India Institute of Engineering & Technology				IV Year BE Branch Electronic & Instrumentation					
Subject Code & Name	**Instructions Hours per week**			**Marks**	**TH**	**CW**	**SW**	**Pr**	**Total**
4EI306 Wireless Communication	**L**	**T**	**P**	**Max**	**100**	**50**			**150**
Duration of Theory Paper: 3 hrs	**4**	**-**	**-**	**Min**	**35**	**25**			**60**

Course Objective: To provide the knowledge of different generation mobile communication system, cellular concept and the aspects of mobile radio environment this is very different than conventional communication system.

Prerequisite: It is expected to know the following concepts: Electromagnetic spectrum, analog and digital modulation techniques, channel coding, random variable and random process.

COURSE OF CONTENTS

Unit I

Introduction to wireless communication system, Concept of cellular mobile system, Frequency reuse, Channel assignment strategies, Handoff strategies, interference and system capacity, Trunking and grade of service improving coverage & capacity in cellular system.

Unit II

Multiple access techniques for wireless communications: FDMA, TDMA, CDMA. Packet radio protocols. Mobile radio propagation: Free space propagation model. Three basic propagation mechanisms: Reflection, Diffraction, Scattering, Brewster angle, ground reflection model, knife-edge diffraction model. Doppler effect.

Unit III

Wireless systems and standards: GSM: Mobile services, system architecture, radio interface, Protocols, localization and calling, handover, security, Frame structure, GSM channel types New data services: HSCSD, GPRS, EDGE, DECT: System architecture.

Unit IV

Spread spectrum System: Fundamental concept of spread spectrum systems (DSSS and FHSS), Pseudo noise sequences, CDMA Principles of operation, forward and reverse CDMA channel. Wireless systems and standards: IS-95, CDMA 2000, WCDMA. Modulation Techniques for mobile radio: GMSK, spread spectrum modulation techniques. Orthogonal frequency division multiplexing.Multi Carrier and spread spectrum: Multi-Carrier CDMA, Multi-Carrier -DS CDMA, Multi-Tone CDMA.

Unit V

Fundamentals of channel coding, Block codes, Convolution codes. Speech coding for wireless system applications: Introduction to DSP techniques in wireless telephone and broadcast system, speech coding techniques for audio and voice: Waveform coders and Vocoders, Channel vocoder, Formant vocoder, Voice-Excited vocoder, Cepstrum vocoder, Liner predictive coders (LPC), Multipulse Excited LPC, Code Excited LPC, Residual Excited LPC.

References:

[1]. Theodore S. Rappaport, *Wireless Communications principles and practice*, Prentice Hall of India, 2002.
[2]. Kamilo Feher, Wireless *Digital Communications*, PHI Private Limited.
[3]. Jochen H. Schiller, *Mobile Communication*, Pearson Education
[4]. William C.Y. Lee, *Wireless and Cellular Telecommunications*, Tata Mc-Graw Hill.
[5]. Vijay K. Garg, *Wireless Network Evolution 2G to 3G*, Pearson Education.