

ELECTIVE II

Course No: MCA-5EL1

Course Title: Wireless and Mobile Communications

Unit I

Classification and types of Wireless telephones. Introduction to Cordless, Fixed Wireless(WLL), Wireless with limited mobility(WLL-M) and (Fully)Mobile Wireless phones. Introduction to various generations of mobile phone technologies and future trends.Wireline vs. Wireless portion of mobile communication networks. Mobile-Originated vs. Mobile-Terminated calls. Mobile-Phone numbers vs. Fixed-Phone numbers; Billing Issues.

Unit II

Electromagnetic spectrum, its use and allocation to well-known bands. Concept of cells, sectorization, coverage area, frequency reuse, cellular networks & handoffs.

Unit III

Wireless Transmission concepts; types of antennas, signal propagation, multipath propagation.Comparison of FDM, TDM and CDM techniques. Basic concepts of Spread Spectrum(SS) technique; Direct Sequence SS versus Frequency Hopping SS.

Unit IV

Simplified implementation of IS-95 CDMA using chip sequences. Concept of CDMA(PCS& Cellular) channel; Forward and Reverse CDMA channel for a cell/sector. Concept of(Walsh)Code Channels within a CDMA Channel. Purpose of Pilot, Sync, Paging, Forward Traffic Channels.Purpose of Access & Reverse TCs.Comparison of Cellular and PCS CDMA networks; frequencies and cell-sizes.Advantages/Disadvantages of smaller cell size. Concept of Voice Coding . Components of Mobile Network Infrastructure: MS, BTS, BSC, MSC; their basic functions and characteristics. Types of handoffs in GSM.Use of HLR and VLR in mobile networks.

References Books:

Andy Dornan, "The Essential Guide to Wireless Communications Applications",Pearson.

Jochen Schiller, "Mobile Communications", Pearson.

K.Pahlavan, P.Krishnamurthy, "Principles of Wireless Networks", Pearson Education.

Andrew Tanenbaum, " Computer Networks(4th Edition)", Pearson Education.

T. Rappaport, "Wireless Communications, Principles and Practice(2nddEition). Pearson Education