MOBILE COMMUNICATION

(Elective Subject)

Course Code:	10B1WEC731	Semester:	7th Semester, B. Tech (ECE)
Credits:	3	Contact Hours:	L-3, T-0,P-0

Course Objectives

1. To make students familier with fundamentals of mobile communication systems
2. To choose system (TDMA/FDMA/CDMA) according to the complexity, installation cost, speed of transmission, channel properties etc.
3. To identify the requirements of mobile communication as compared to static communication
4. To identify the limitations of 2G and 2.5G wireless mobile communication and use design of 3G and beyond mobile communication systems
5. As a prerequisite for the course in Wireless LANs

Course Outcomes

1. To make students familiar with various generations of mobile communications
2. To understand the concept of cellular communication
3. To understand the basics of wireless communication
4. Knowledge of GSM mobile communication standard, its architecture, logical channels, advantages and limitations.
5. Knowledge of IS-95 CDMA mobile communication standard, its architecture, logical channels, advantages and limitations.
6. Knowledge of 3G mobile standards and their comparison with 2G technologies.
7. To under multicarrier communication systems.
8. To differentiate various Wireless LANs.

Course Contents

Unit	Topics	**References** (chapter number, page no. etc)	Lectures
1.	Evolution of mobile communication systems. 1G, 2G, 2.5G & 3G systems. IMT2000, FDD, TDD, FDMA, TDMA, CDMA, SDMA. Radio frequency spectrum and communication technology. Block diagram of mobile communication system. Problems of mobile communication: spectrum, propagation. Near far problem.	T S Rapaport: Pages 1-39, Jochen Schiller: Pages 7-15	4
2.	The cellular Concept – Introduction, Frequency reuse, Channel assignment strategies, Handoff strategies, Interference and system capacity, Trucking and grade of services, Improving coverage & capacity in cellular system	T S Rapaport: Pages 57-93	6
3.	GSM standards and architecture, GSM Radio aspects, typical call flow sequences in GSM, security aspects. GPRS	Jochen Schiller: Pages 96- 120 Raymond Steel: 65-147	8

4.	CDMA standards**:** Spread spectrum, direct sequence and frequency hop spread spectrum, IS-95 CDMA architecture, forward link and reverse link,cdma2000	Raymond Steel: 205-281 T S Rapaport: Pages 569- 582	8
5.	WCDMA: Frame structure, UTRA FDD, UTRA TDD, UMTS, architecture	Jochen Schiller: 136-155	4
6.	Introduction to WLAN: Infrastructure based and adhoc networks, IEEE 802.11, IEEE 802.11a, IEEE 802.11b. Bluetooth, WiMAX	Jochen Schiller: 201-238, 269-290	8
7.	4G Systems: Introduction to OFDM and MC-CDMA	L. Hanzo, T. Keller: 1-18, 203-217	6
		Total Number of Lectures	**44**

Evaluation Scheme

1. Test 1 :15 marks
2. Test 2 : 25 marks
3. Test 3 : 35 marks
4. **Internal Assessment** : 25 marks
    - 10 Marks : Class performance, Tutorials & Assignments
    - 10 Marks : Quizzes
    - 5 marks : Attendance

Text Books

1) T. S. Rappaport, Wireless Communications, PHI, 2002.

2) Mobile Communication, Jochen Schiller, Pearson.

Reference Books

1) William C.Y. Lee, Mobile Cellular Telecommunications - Analog & Digital Systems, Mc.Graw Hill, 1995