

**4CP52: WIRELESS AND MOBILE COMMUNICATIONS**  
**CREDITS - 4 (LTP: 3, 0, 1)**

**Course objective:**

To impart the fundamentals of wireless communications; understanding of various protocols used in wireless networks; and fundamentals of cellular systems with case studies of various standardized wireless systems

**Teaching and Assessment Scheme:**

Teaching Scheme (Hours per Week)			Credits	Assessment Scheme				
L	T	P		Theory Marks		Practical Marks		Total Marks
			ESE	CE	ESE	CE		
3	0	2	4	60	40	20	30	150

**Course Contents:**

Unit No.	Topics	Teaching Hours
<b>1</b>	<b>Introduction:</b> Wired vs wireless networks; Overview of wireless applications	<b>2</b>
<b>2</b>	<b>Wireless Communication Fundamentals:</b> Frequencies for radio transmission; Radio wave propagation and its models; Fading; Spread spectrum technologies; Wireless link improvement schemes	<b>12</b>
<b>3</b>	<b>Cellular systems:</b> Frequency reuse; Channel assignment strategies; Handoff strategies; Interference and system capacity; Improving coverage and Capacity in cellular systems; Mobility management	<b>6</b>
<b>4</b>	<b>Case studies of cellular systems:</b> Global system for mobile communication (GSM); General packet radio service (GPRS); IS-95	<b>6</b>
<b>5</b>	<b>Wireless Networking:</b> Medium access control protocols: TDMA, FDMA, CDMA, SDMA; Packet radio access; Mobile IP; IPv6; Ad-hoc networks and routing; Mobile Transport layer protocols; Power saving mechanisms in wireless networks; Security issues in wireless networks	<b>12</b>
<b>6</b>	<b>Introduction to standards and technologies:</b> IEEE 802.11 (a, b, g, n, ac, ad, ah); IEEE 802.16 (Wi-MAX); 3G (CDMA 2000); 4G; LTE; IEEE 802.15 (Bluetooth; ZigBee)	<b>7</b>
<b>Total</b>		<b>45</b>

**List of References:**

1. William Stallings, “*Wireless Communications & Networks*”, Pearson
2. Jochen Schiller; “*Mobile Communications*”, Pearson
3. Theodore Rappaport, “*Wireless Communications: Principles and Practice*”, Pearson / PHI
4. Kaveh Pahlavan, Prashant Krishnamurthy, “*Principles of Wireless Networks: A unified approach*”, Pearson Education
5. Andreas Molisch, “*Wireless Communications*”, Wiley

**Course Outcomes (COs):**

At the end of this course students will be able to...

1. Describe the fundamentals of wireless and mobile communications
2. Explain various protocols at MAC; network; and transport layers of different types of wireless networks
3. Analyse a simple cellular system to determine possible improvements to enhance the capacity of the system
4. Illustrate different power saving mechanisms in mobile communication systems
5. Describe different security & privacy issues and the possible remedies thereof; for different wireless systems
6. Describe the concepts of different wireless technologies studied in the course.