

Branch Name:	Information and Communication Technology
Semester/Year:	Semester VIII / Fourth Year
Subject Title:	Wireless Communication
Subject Code:	1ET1070803
Pre-requisite:	Analog and Digital Communication

Course Objective:

- 1 To Understand the functioning of wireless communication system and evolution of different wireless communication systems and standards.
2. To compare recent technologies used for wireless communication.
3. To explain multiple access techniques for Wireless Communication.

Teaching and Examination Scheme:

Teaching Scheme (Hours Per Week)				Examination Scheme (Marks)				Total
L	T	P	Credit	Theory		Practical		
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
3	0	2	4	70	30	30	20	150

Content:

Sr. No.	Topic	Total Hrs.	% Weightage
1	Introduction to Wireless Communication System: Evolution of mobile communications, Mobile Radio System around the world, Types of Wireless communication System, Comparison of Common wireless system, Trend in Cellular radio and personal Communication. Second, Third and Fourth generation Cellular Networks Comparison	8	20
2	Cellular Concept And Wireless System Hexagonal cell and frequency reuse, hard, soft and forced handoffs, umbrella cell concept, distance to frequency reuse distance, channel and co channel interference reduction factor, S/I ratio consideration and calculation of minimum co-channel and Adjacent interference, Improving coverage and capacity- cell splitting, cell sectorization, repeaters, microcell zone concept, panel antenna design consideration.	10	25
3	Digital Cellular Systems And Standards: GSM system architecture, Radio interface, Protocols, Localization and calling, Authentication and security in GSM, GSM speech coding, Architecture of IS-95 CDMA system, RAKE Receiver, GPRS system architecture.	10	25
4	Multiple Access Techniques: Introduction, Comparisons of multiple Access Strategies TDMA, CDMA, FDMA, OFDM, CSMA Protocols.	7	15
5	Advances In Wireless Communication: Basics of MIMO and OFDM, Wi- Fi, Wi- MAX, bluetooth, ZigBee.	7	15

Course Outcome:

After learning the course the students will be able to:

1. Understand the basic concepts of basic Cellular System and the design requirements.
2. Understanding the concept related to radio resource management techniques such as power control, channel allocation and handoffs.
3. Learn depth understanding of the design consideration and architecture for different Wireless Systems like GSM, CDMA, and GPRS.
4. Get knowledge and awareness of the technologies for how to effectively share spectrum through multiple access techniques i.e. TDMA, CDMA, FDMA etc.
5. To get knowledge of the emerging trends in Wireless communication like WiFi, WiMAX, OFDM and MIMO.

Text Book:

1. Wireless Communication, Theodore S. Rappaport, Prentice hall.

List of Reference Books:

1. Wireless Communications –T.L.Singh –TMH.
2. Wireless Communications and Networking, Vijay Garg, Elsevier.
3. Mobile Communications Engineering, William C. Y. Lee, Mc Graw Hill Publications.
4. Wireless digital communication, Kamilo Feher, PHI.

List of Suggested titles of Experiments:

1. Study of Baseband communication.
2. Study of GSM Architecture.
3. Study of CDMA Architecture.
4. Study and verify various GSM AT commands.
5. Study of Adaptive Linear Equalizer using trainer kit.
6. To observe the BER performance of DS-CDMA using mixed codes in multipath channel using RAKE receiver for single user case.
7. To determine the free space loss and the power received using Matlab program.
8. To write a Matlab program to calculate the link budget for satellite communication.
9. To write a Matlab program to calculate the median path loss for Okumura model for outdoor propagation.
10. To write a Matlab program to calculate the median path loss for Hata model for outdoor propagation.

e-Resources (If any):

1. <https://nptel.ac.in/courses/117/102/117102062/>