Devi Ahilya University, Indore, India **Institute of Engineering & Technology**				**III Year B.E. (Electronics and Telecommunication Engg.)**			
Subject Code & Name	**Instructions Hours per Week**			**Credits**			
6ETRC1 MOBILE AND WIRELESS COMMUNICATION	**L**	**T**	**P**	**L**	**T**	**P**	**Total**
	3	**1**	**0**	**3**	**1**	**0**	**4**
Duration of Theory Paper: 3 Hours							

Course Learning Objective:

The course is designed:

1. To understand the evolution of mobile communication system from 1G to 5G.
2. To learn various transmission and reception techniques used in different mobile communication systems.
3. To know the importance of communication channel in performance of mobile communication system.
4. To learn about the various frequency and channel assignment techniques used in cellular mobile system.
5. To know the various cellular wireless mobile standards like GSM and CDMA that are being used around the world.

Prerequisites:

Knowledge of analog and digital communication systems

COURSE CONTENTS

Unit –I

Introduction to Wireless Communication: Introduction to Wireless Communication: Classification of different wireless communication networks, Transceiver techniques for Mobile wireless communication - Modulation, Channel Coding, Speech Coding, Spread spectrum Modulation, Multiple Access Techniques, Duplexing.

Unit –II

Channel Characterization: Characterizing Mobile-Radio Propagation, Large-Scale Fading,Path loss models, Small-Scale Fading, Types of small scale fading, fading parameters –Coherence time, coherence BW, Delay spread, Doppler spread. Models for Fading channel-Rayleigh Fading and Rician distribution for fading channel, Fading mitigation techniques -Equalization Techniques, Diversity Techniques, RAKE Receiver, OFDM.

Unit –III

Introduction to Cellular Mobile System: A basic cellular system, Performance criteria,Concept of frequency reuse channels, C/I ratio, cell splitting, sectoring, types of non co-channel interference, co-channel interference: measurement & reduction factor, Frequency management,Channel Assignment, Handoffs, Dropped call rate.

Unit –IV

GSM: System architecture, Air interfaces, Multiple access, Channel organization and framing structure, Call set-up procedure, Protocols and signaling, Authentication and security.CDMA: CDMA Evolution, CDMA IS-95 systems - its forward and reverse links, PN sequence related to IS-95, Power control, Trans receiver techniques used in CDMA, call processing steps,Hand-off process.

Unit – V

Advanced Mobile Networks: Wireless Networks GPRS, EDGE, 3G-UMTS, Wi-max, WLAN,their architecture and working. Overview of IP and Mobile IP, Introduction to 4G & 5G systems.

Course Outcomes:

Students earned credits will develop understanding about

CO.No.	CO	PO
CO1	Various processes and their types involved in mobile communication system.	PO- 1, PO-2
CO2	Cellular system designing concepts.	PO-3
CO3	Current and future Mobile communication standards and techniques used in standards.	PO-5
CO4	Architecture and working of various mobile communication standards	PO-11
CO5	Various advanced wireless mobile networks.	PO-11

CO-PO Relationship

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-	PO-	PO-

										10	11	12
CO1	2	2										
CO2			2									
CO3					2							
CO4											2	
CO5											2	

BOOKS RECOMMENDED:

[1].S Misra, “Wireless Communications and Networks” 3G and Beyond, Second Edition, Mc Graw Hill, 2013.
[2].A F Molisch, Wireless communication, Second Edition, Wiley Publication, 2014.
[3].A Biswas, M Chaudhary, Wireless Communication, Theory and Applications, Cambridge University Press, First Edition, 2017.
[4].T.S.Rappaport, “Wireless Communications: Principles and Practice, Second Edition, PearsonEducation/ Prentice Hall ofIndia, Third Indian Reprint 2003.
[5].W.C.Y.Lee, "Mobile Communications Engineering: Theory and applications, Second Edition, McGraw-Hill International, 1998.