

CELLULAR AND MOBILE COMMUNICATION

VI Semester: ECE								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
AEC520	ELECTIVE	L	T	P	C	CIA	SEE	Total
		3	-	-	3	30	70	100
Contact Classes: 45		Tutorial Classes: -		Practical Classes: Nil			Total Classes: 45	
<p>OBJECTIVES:</p> <p>The course should enable the students to:</p> <ol style="list-style-type: none"> I. Analyze and design wireless and mobile cellular systems. II. Understand impairments due to multipath fading channel and be able simulate standard stochastic channel models for various environments. III. Evaluate the fundamental techniques to overcome the different fading effects. IV. Interpret current and proposed cellular technologies. V. Able to work in advanced research wireless and mobile cellular programs. <p>COURSE OUTCOMES:</p> <p>CO 1: Demonstrate cellular mobile system design concepts in wireless mobile communication networks.</p> <p>CO 2: Design of Antenna system, Antenna parameters and their effects, diversity receiver, non co-channel Interference different.</p> <p>CO 3: Understand the concepts of Handoff, dropped calls and cell splitting, Intersystem handoff.</p> <p>CO 4: Imbibe knowledge about Wireless Systems And Standards GSM channels, multiplex access scheme, TDMA, CDMA.</p> <p>CO5: Intelligent Network For Wireless Communications SS7 network and ISDN for AIN, AIN for mobile communication.</p> <p>COURSE LEARNING OUTCOMES (CLOs):</p> <ol style="list-style-type: none"> 1. Identify the limitations of conventional Mobile Telephone Systems; understand the basic cellular mobile system. 2. Remember Uniqueness of mobile radio environment- fading- Factors Time dispersion parameters, Coherence bandwidth, Doppler spread and coherence time. 3. Understand the concept of frequency Reuse channels,deduce Co- channel interference reduction factor. 4. Analyze various multiple access schemes and techniques used in wireless communication. 5. Explain Co-channel interference with near end far end interference. 6. Understand Signal reflections in flat and hilly terrain, Effect of human made structures 7. Remember concepts of cell coverage for signal and traffic. 8. Demonstrate wireless local area networks and their specifications in communication system. 9. Understand Signal reflections in flat and hilly terrain, Effect of human made structures. 10. Understand Cell Site And Mobile Antennas 11. Understand Phase difference between direct and reflected path. 12. Understand the operation of the various wireless area networks such as GSM,IS-95,GPRS and SMS. 13. Understand the existing and emerging wireless standards in wireless wide area networks 14. Demonstrate wireless local area networks and their specifications in communication system. 15. Understand the existing and emerging wireless standards in wireless wide area networks. 16. Understand the SS7 network and ISDN for AIN, AIN for mobile communication. 17. Remember the Intelligent cell concept, advanced intelligent network. 								

UNIT-I	CELLULAR MOBILE RADIO SYSTEMS	Classes: 10
Introduction to cellular mobile System, performance criteria, uniqueness of mobile radio environment, operation of cellular systems, hexagonal shaped cells, analog and digital Cellular systems, General description of the problem, concept of frequency channels, Co-channel Interference Reduction Factor, desired C/I from a normal case in a omni directional Antenna system, Cell splitting, consideration of the components of Cellular system.		
UNIT -II	INTERFERENCE AND CELL COVERAGE FOR SIGNAL AND TRAFFIC	Classes: 09
Introduction to Co-Channel Interference, real time Co-Channel interference, Co-Channel measurement, design of Antenna system, Antenna parameters and their effects, diversity receiver, non-co channel interference-different types, Signal reflections in flat and hilly terrain, effect of human made structures, phase difference between direct and reflected paths, constant standard deviation, straight line path loss slope, general formula for mobile propagation over water and flat open area, near and long distance propagation antenna height gain, form of a point to point model.		
UNIT -III	CELL SITE AND MOBILE ANTENNAS	Classes: 10
Sum and difference patterns and their synthesis, omni directional antennas, directional antennas for interference reduction, space diversity antennas, umbrella pattern antennas, minimum separation of cell site antennas, high gain antennas, Numbering and grouping, setup access and paging channels channel assignments to cell sites and mobile units, channel sharing and borrowing, sectorization, overlaid cells, non fixed channel assignment, Handoff, dropped calls and cell splitting, types of handoff, handoff invitation, delaying handoff, forced handoff, mobile assigned handoff. Intersystem handoff, cell splitting, micro cells, vehicle locating methods, dropped call rates and their evaluation.		
UNIT -IV	WIRELESS SYSTEMS AND STANDARDS	Classes: 08
Second generation and Third generation Wireless Networks and Standards, WLL, Bluetooth, GSM, IS95, DECT, GSM architecture, GSM channels, multiplex access scheme, TDMA, CDM.		
UNIT -V	INTELLIGENT NETWORK FOR WIRELESS COMMUNICATIONS	Classes: 08
Intelligent cell concept, advanced intelligent network, SS7 network and ISDN for AIN, AIN for mobile communication, asynchronous transfer mode technology, future public land mobile telecommunication system, wireless information superhighway.		
Text Books:		
<ol style="list-style-type: none"> 1. Theodore .S. Rapport, —Wireless Communications, Pearson Education, 2nd Edition, 2010. 2. Upen Dalal, “Wireless communication”, oxford University press, 2010. 3. Kaveh Pahlvan, Prashant Krishnamurthy, “Principle of wireless networks”, A United Approach, Pearson Education, 2004. 4. Andrea Goldsmith, “Wireless Communications”, Cambridge University Press, 2005 		
Reference Books:		
<ol style="list-style-type: none"> 1. Theodore. S. Rapport, "Wireless Communications", 3rd Edition, Pearson Education, 2003. 2. Lee, "Wireless and Mobile Communications", McGraw Hill, 3rd Edition, 2006. 3. Jon W. Mark and Weihua Zhqung, "Wireless Communication and Networking", PHI, 1st Edition, 2005. 4. R. Blake, "Wireless Communication Technology", Thompson Asia Pvt. Ltd., 1st Edition 2004. 		

Web References:

1. <https://accessengineeringlibrary.com>
2. [http:// www.radio-electronics.com](http://www.radio-electronics.com)
3. <https://www.jntubook.com>
4. <http://www.iare.ac.in>

E-Text Books:

5. http://www.iitg.ernet.in/scifac/qip/public_html/cd_cell/EC632.pdf
6. https://books.google.co.in/books/about/Cellular_and_Mobile_Communications
7. 3. [https://technicalpublications.org/.../books/ Cellular and Mobile Communications.](https://technicalpublications.org/.../books/Cellular_and_Mobile_Communications)