Course Code	Course Title	L	T	P	C
1152EC140	CELLULAR MOBILE COMMUNICATION	3	0	0	3

a) Course Category

Program Elective

b) Preamble

This course provides an introduction to the basic concepts and techniques of cellular radio Communication, Mathematically analyze mobile radio propagation mechanisms, design Base Station (BS), Mobile Station (MS) parameters, analyze the antenna configurations and types, to study the recent trends adopted in cellular and wireless systems and standards.

c) Prerequisite

Nil

d) Related Courses

Wireless Ad Hoc & sensor networks

e) Course Outcomes

On successful completion of this course the student will be able to

CO Nos.	Course Outcomes	Knowledge Level (Based on Revised Bloom's Taxonomy)
CO1	Explain the basic concepts of cellular radio and capacity improvement techniques.	K2
CO2	Apply the concepts of mobile radio propagation models.	K3
CO3	Illustrate fading mechanism, equalization techniques and Diversity concepts.	K2
CO4	Classify Speech coding techniques and multiple access	K2

	techniques.	
CO5	Describe the latest wireless technologies and standards.	K2

f) **Correlation of COs with POs**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	L	L	-	-	-	L	L	-	L	-	-	-	-	-
CO2	H	M	M	-	-	-	-	L	L	-	L	-	-	-
CO3	M	H	-	-	-	-	-	-	L	-	-	-	-	-
CO4	H	H	L	L	M	-	-	-	L	-	-	L	-	-
CO5	L	H	-	-	-	-	-	-	L	-	-	M	-	-

f) Course Content

UNIT I INTRODUCTION TO WIRELESS COMMUNICATION 9

History and evolution of mobile radio communication-Examples of wireless communication-Generations –Frequency reuse – Channel Assignment strategies – Handoff strategies – Interference- Trucking and Grade of service-Improving Coverage and capacity of cellular system .

UNIT II MOBILE RADIO PROPAGATION 9

Radio wave propagation-Free space propagation model – Basic propagation mechanism-Ground reflection model, Knife edge diffraction model, radar cross section model-Practical Link budget design - Indoor and outdoor propagation model.

UNIT III SMALL-SCALE FADING AND EQUALIZATION 9

Small-Scale Fading: Small scale multipath propagation - Small scale Multipath measurements - parameters of mobile multipath channels - types of small scale fading - statistical models for multipath fading channels.

Equalization: Survey of Equalization Techniques, Linear Equalization, Non-Linear Equalization - Algorithms for Adaptive Equalization – Diversity Techniques – Rake Receiver.

UNIT IV CODING AND MULTIPLE ACCESS TECHNIQUES 9

Coding: RS codes for CDPD – Vocoders – Linear Predictive Coders – Selection of Speech Coders for Mobile Communications – GSM Codec. Multiple Access Techniques: FDMA, TDMA, CDMA, SDMA

UNIT V WIRELESS SYSTEMS AND STANDARDS. 9

GSM - CDMA - 3G-4G (LTE) - NFC systems-WLAN technology- WLL- Ad hoc networks- Bluetooth-WIFI.

Total 45 Hrs

g) Learning Resources

Text Books

1. T.S.Rappaport, "Wireless Communications: Principles and Practice, Second Edition, Pearson Education/ Prentice Hall of India, Third Indian Reprint 2003.
2. W.C.Y.Lee,"Mobile Communication Design Fundamentals",secondedition,john Wiley & sons,1993

Reference Books

1. MuthuChidambara Nathan, Wireless Communications, PHI, 1st edition 2008.
2. Goldsmith, Wireless Communications, Cambridge University Press, 1st edition 2005.
3. R. Blake, " Wireless Communication Technology", Thomson Delmar, 1st edition 2000.
4. W.C.Y.Lee, "Mobile Communications Engineering: Theory and applications, Second Edition, McGraw-Hill International, 1998.

Online Resources

1. http://www.see.ed.ac.uk/~hxh/ADCCourseMaterial/4.rc.2.pdf
2. http://www.diva-portal.org/smash/get/diva2:501119/FULLTEXT01.pdf
3. http://www.durofy.com/multiple-access-techniques-fdma-tdma-cdma/
4. www.nptel.in