

EC-407**MOBILE AND CELLULAR COMMUNICATIONS**

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COURSE OBJECTIVES:

1. To know the evolution of Mobile communication and cell concept to improve capacity of the system.
2. To know the fading mechanism and types of fading and effect of fading on Mobile communication.
3. To know the role of equalization in Mobile communication and to study different types of Equalizers and Diversity techniques.
4. To know the types of channel coding techniques, data transmission modes and services of GSM.
5. To know the types of channel coding techniques, data transmission modes and services of CDMA.

COURSE OUTCOMES:**After successful completion of the course, the students are able to**

1. understand cellular concepts
2. model large and small scale fading mechanisms on mobile radio propagation
3. demonstrate Equalizers and Diversity techniques.
4. demonstrate Global System For Mobile (GSM).
5. demonstrate Code Division Multiple Access (CDMA).

UNIT I*Text Book - 1 (10)*

INTRODUCTION TO MOBILE COMMUNICATION : Evolution of Mobile Radio Communication, Examples of Wireless Communication Systems. Paging system, Cordless telephones systems, Cellular telephone Systems, Cellular concept: Frequency reuse, Channel Assignment strategies, Hand off strategies. Interference and System capacity, Improving coverage and capacity in cellular systems.

UNIT II*Text Book - 1 (12)***MOBILE RADIO PROPAGATION:**

Large Scale Fading : Free space propagation model, Three basic propagation mechanisms, Reflection, Ground Reflection(Two-Ray)Model, Diffraction, Scattering, Practical link budget using path loss models.

Small Scale Fading : Multipath Propagation, Types of small scale fading, Parameters of Mobile Multipath channels, Fading effects due to multipath time delay Spread and Doppler spread.

UNIT III*Text Book - 2 (10)*

Equalization : Fundamentals of Equalizers, Linear equalizers, Non-linear equalizers, Decision feedback equalizers, MLSE.

Diversity Techniques : Space diversity: MRC, EGC Selection diversity, Polarization diversity, Frequency diversity, Time diversity.

UNIT IV*Text Book - 2 (10)*

Global System For Mobile (GSM) : Historical overview, System overview, The air interface, Logical and physical channels, Synchronization, Coding, Equalizer, Circuit-switched data transmission, Establishing a connection and handover, Services and billing.

UNIT V*Text Book - 2 (10)*

CDMA : Historical overview, System overview, Air interface, Coding, Spreading and Modulation, Logical and Physical channels, Handover.

LEARNING RESOURCES:

TEXT BOOK(s):

1. Theodore S. Rappaport - Wireless Communications Principles and Practice, 2nd Edition, Pearson Education, 2003.
2. Andreas F. Molisch - Wireless Communications, John Wiley, 2nd Edition, 2006.

REFERENCE BOOK(s):

1. Kamilio Feher - Wireless Digital Communications, PHI, 2003
2. W.C.Y. Lee - Mobile Cellular Communications, 2nd Edition, MC Graw Hill, 1995.
3. Yi-Bing Lin - Wireless and Mobile Network Architectures, 2nd Edition, Wiley, 2008.

WEB RESOURCES:

<http://nptel.ac.in/courses/>