JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV Year B.Tech. E.C.E. I-Sem **L T /P/D C**

4 -/-/- 4

(A70434) CELLULAR AND MOBILE COMMUNICATIONS

UNIT – I

INTRODUCTION TO CELLULAR MOBILE RADIO SYSTEMS:

Limitations of conventional mobile telephone systems, Basic Cellular Mobile System, First, second, third, and fourth generation cellular wireless systems, Uniqueness of mobile radio environment. Fading-Time dispersion parameters, Coherence bandwidth, Doppler spread and coherence time.

FUNDAMENTALS OF CELLULAR RADIO SYSTEM DESIGN

Concept of frequency reuse, Co-channel interference, co-channel interference reduction factor, Desired C/I from a normal case in a omnidirectional antenna system, system capacity, trunking and grade of service, Improving coverage and capacity in cellular systems- Cell splitting, Sectoring, Microcell zone concept.

UNIT – II

CO-CHANNEL INTERFERENCE

Measurement of real time Co-channel interference, Design of antenna system, Antenna parameters and their effects, Diversity technique- Space diversity, Polarization diversity, Frequency diversity, Time diversity.

NON CO-CHANNEL INTERFERENCE

Adjacent channel interference, Near end far end interference, cross talk, Effects on coverage and interference by power decrease, Antenna height decrease, Effects of cell site components.

UNIT – III

CELL COVERAGE FOR SIGNAL AND TRAFFIC

Signal reflections in flat and hilly terrain, Effect of human made structures, Phase difference between direct and reflected path, constant standard deviation, Straight line path loss slope, General formula for mobile propagation over water and flat open area, near and long distance propagation, Path loss from a point to point prediction model in different conditions, merits of Lee model.

CELL SITE AND MOBILE ANTENNAS

Space diversity antennas, Umbrella pattern antennas, and minimum separation of cell site antennas, mobile antennas.

UNIT – IV

FREQUENCY MANAGEMENT AND CHANNEL ASSIGNMENT

Numbering and grouping, Setup access and paging channels, Channel assignments to cell sites and mobile units, Channel sharing and barrowing, sectorization, Overlaid cells, Non fixed channel assignment.

UNIT – V

HANDOFFS AND DROPPED CALLS

Handoffs initiation, Types of handoff, Delaying handoff, Advantages of handoff, Power difference handoff, Forced handoff, Mobile assisted and soft handoff. Intersystem handoff, Introduction to dropped call rates and their evaluation.

TEXTBOOKS:

1. Mobile Cellular Telecommunciations-W.C.Y.Lee,Mc Graw Hill,2nd Edn.,1989.

2. Wireless Communications-Theodre.S.Rapport, Pearson education,2nd Edn.,2002.

3. Mobile Cellular Communications-Gottapu sashibushan rao,pearson,2012.

REFERENCES:

1. Principles of mobile communications-Gordon L.Stuber,Speinger international,2nd Edn.,2001.

2. Modern Wireless Communications-Simon Haykin,Michael moher,Pearson Education,2005.

3 Wireless Communications theory and techniques,Asrar U.H.Sheikh,Springer,2004.

4. Wireless Communications and networking,Vijay Garg,Elsevier Publications,2007.

5. Wireless Communications-Andrea Goldsmith,Cambridge University Press,2005.