

CELLULAR MOBILE COMMUNICATION (EC-602)

Unit-I

Introduction to cellular mobile system, a basic cellular system, performance criteria, Uniqueness of mobile radio environment, Operation of cellular systems, Planning of cellular system. Elements of Cellular Radio System Design: General description of problem, Concept of frequency reuse, channels, Co channel interference, reduction factor, Hand off mechanisms, Cell splitting, Consideration of the components of cellular systems.

Unit-II

Co-channel Interference, real time co-channel interference measurement at mobile radio transceivers, Design of antenna system -Omni directional and directional, Lowering the antenna height, Reduction of co-channel interference, Umbrella-Pattern effect, Diversity receiver, Designing a system to serve a predefined area that experiences Co-Channel Interference. Types of Non co-channel interference- adjacent channel Interference, Near-End-Far-End interference, Effects on Near-End mobile units, Cross-Talk, Effects on coverage and interference by applying power decrease, antenna height decrease, Beam Tilting, Effects of cell site Components, Interference between systems, UHF TV Interference, long distance interference.

Unit-III

Cell coverage for signal and traffic : General introduction, Obtaining the mobile point-to-point model, Propagation over water or flat open area, foliage loss, propagation in near in distance, long distance propagation, point-to-point prediction model, Cell site antenna heights and signal coverage cells, Mobile-to-mobile propagation. Cell site antennas and mobile antennas: Equivalent circuits of antennas, Gain and Pattern Relationship, Sum and Difference patterns, Antennas at cell site, mobile antennas.

Unit-IV

Frequency management and Channel Assignment: Frequency management, Frequency spectrum utilization, Setup channels, Fixed channels assignment, Non-fixed channel assignment algorithms, Traffic and channel assignment. Handoffs and Dropped Calls: Types of Handoff, Initiation of Handoff, Delaying a Handoff, Forced Handoff, Queuing of Handoff, Power-Difference Handoff, Mobile Assisted Handoff and Soft Handoff, Cell-site Handoff and Intersystem Handoff, Dropped Call Rate.

Unit-V

Digital Cellular System: GSM, Architecture, Layer Modeling, Transmission, GSM channels and Channel Modes, Multiple Access Scheme: CDMA, Terms of CDMA systems, output power limits and control, Modulation characteristics, Call processing, Hand off procedures. Miscellaneous Mobile Systems: TDD Systems, Cordless Phone, PDC, PCN, PCS, Non Cellular Systems, Mobile Integrated Radio Systems, Mobile Satellite Communication.