Course Contents

UNIT- I

Introduction to Satellite Communication: Principles and architecture of satellite Communication, Brief history of Satellite systems, advantages, disadvantages, applications and frequency bands used for satellite communication.

The Earth Segment: Introduction, Receive-Only Home TV Systems, outdoor unit, indoor unit for analog (FM), Master Antenna TV System, Community Antenna TV System, Transmit-Receive Earth Stations

UNIT-II

Space Segment: Introduction, Power Supply, Attitude Control, Station Keeping, Thermal Control, TT&C Subsystem, Transponders, Antenna Subsystem The Space Link: Introduction, Equivalent Isotropic Radiated Power, Transmission Losses, the Link-Power Budget Equation, System Noise, Carrier-to-Noise Ratio, Uplink budget calculations, Downlink budget calculations, Effects of Rain, Combined Uplink and Downlink C/NRatio, Inter-modulation Noise, Inter-Satellite Links.

UNIT-III

Orbits and Launching Methods: Introduction, Kepler’s Laws, Definitions of Terms for Earth-Orbiting Satellites, Orbital Elements, Apogee and Perigee Heights, Orbit Perturbations, Inclined orbits. The Geostationary Orbit: Introduction, Antenna Look Angles, The Polar Mount Antenna, Limits of Visibility, Near Geostationary Orbits, Earth Eclipse of Satellite, Sun Transit Outage, Launching Orbits

UNIT IV

Satellite Access: Introduction, Pre-assigned FDMA, Demand-Assigned FDMA, Spade System, TWT Amplifier Operation and FDMA downlink analysis, TDMA, TDMA frame structure and Reference burst structure burst, Frame efficiency and channel capacity, Pre-assigned TDMA, Demand-assigned TDMA, Comparison of uplink power requirements for FDMA and TDMA, On-Board Signal Processing for FDMA/TDM Operation, Satellite-Switched TDMA, Code-Division Multiple Access.

Text /Reference Books:

1.Dennis Roddy, “Satellite Communication” 4th Edition, McGraw Hill, 2009

 2.Timothy Pratt, Charles W. Bostian, Jeremy E. Allnutt “Satellite Communications”Wiley India, 2nd edition 2002

3.Tri T. Ha, “Digital Satellite Communications” Tata McGraw Hill, 2009 4.Dr.D.C. Agarwal, “Satellite Communications” Khanna Publishers, 200