7th Semester

PET7J002   SATELLITE COMMUNICATION SYSTEMS

MODULE-I (12 Hours)

Introduction to satellite communication: Orbital mechanics and parameters look angle determination, Launches and Lunch vehicle, Orbital effects in communication system performance. Attitude and orbit control system (AOCS), TT&C, Description of spacecraft System ; Transponders,

Satellite Link Design: Basics of transmission theory, system noise temperature and G/T ratio, Uplink and Downlink design, design of satellite links for specified (C/N) performance.

MODULE–II   (10 Hours)

Analog telephone and television transmission: Energy dispersal, digital transmission

Multiple Accesses: Multiplexing techniques for satellite links, Comprehensive study on FDMA, TDMA and CDMA; Spread Spectrum Transmission and Reception; Estimating Channel requirements, SPADE, Random access

MODULE-III   (12 Hours)

5. Propagation on satellite: Earth paths and influence on link design; Quantifying attenuation and depolarization, hydrometric & non hydrometric effects, ionosphere effects, rain and ice effects.

Satellite Antennas: Types of antenna and relationships; Basic Antennas Theory – linear, rectangular & circular aperture; Gain, pointing loss,

MODULE-IV

Earth station Technology: Earth station design; Design of large antennas – Cassegrain antennas, optimizing gain of large antenna, antenna temperature, feed system for large cassegrain antennas,

Design of small earth station antennas: Front fed paraboloid reflector antennas, offset fed antennas, beam steering, Global Beam Antenna, equipment for earth station.

ADDITIONAL MODULE (Terminal Examination-Internal)

Equipment reliability and space qualification.

Application of Satellite communication: Network distribution and direct broad casting TV, fundamentals of mobile communication satellite

Text Books

1) Satellite Communication, T. Pratt, C. Bostian, John Wiley Co, 2nd Edition.

2) Satellite Communication, Principles & Applications, R.N.Mutagi, Oxford University Press, 1st Edition, 2016

Reference Books

1. Digital Communication with Satellite and Fiber Optic Application, HarlodKolimbins, PHI

2. Satellite Communication, Robert M. Gagliardi, CBS Publishers

3. Satellitte Communication Systems, Richharia. BSP BOOKS PVT LTD.

4. Satellitte Communication Engg., MichealKolawole, BSP BOOKS PVT LTD