

SATELLITE COMMUNICATIONS

Course Code	20EC2702B	Year	IV	Semester	I
Course Category	Open Elective-IV	Branch	Common to All	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	--
Continuous Internal Evaluation:	30	Semester End Evaluation:	70	Total Marks:	100

Course Outcomes

Upon successful completion of the course, the student will be able to

CO1	Illustrate the basic concepts of satellite communication and different Frequency allocations for satellite services. (L2)
CO2	Analyze the satellite orbits and link design for transmission & reception of signals (L4)
CO3	Analyze various satellite subsystems and its functionality. (L4)
CO4	Choose appropriate multiple access technique for a given satellite communication application (L3)

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:High, 2: Medium, 1:Low)

	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO2
CO1	2									1				1
CO2		3								2				2
CO3		3								2				2
CO4	2									2				2
OVER ALL WEIGHTS	2	3								2				2

Syllabus

Unit No.	Contents	Mapped CO
I	Introduction : Historical Back-ground, Basic Concepts of Satellite Communications, Frequency allocations for Satellite Services, Applications.	CO1
II	Orbital Mechanics And Launchers: Orbital Mechanics, Look Angle determination, Orbital perturbations, Orbit determination, launches and launch vehicles, Orbital effects in communication systems performance.	CO1, CO2
III	Satellite Subsystems: Attitude and orbit control system, telemetry, tracking, Command and monitoring, power systems, communication subsystems, Satellite antenna Equipment reliability and Space qualification.	CO1, CO3
IV	Satellite Link Design: Basic transmission theory, system noise temperature and G/T ratio, Design of down links, up link design, Design of satellite links for specified C/N, System design example.	CO1, CO2
V	Multiple Access: Frequency division multiple access (FDMA) Intermodulation, Calculation of C/N. Time division Multiple Access (TDMA) Frame structure, Examples. Satellite Switched TDMA On-board processing, DAMA, Code Division Multiple access (CDMA).	CO4

Learning Resources

Text Books

1. Satellite Communications – Timothy Pratt, Charles Bostian and Jeremy Allnut, WSE, Wiley Publications, 2rd Edition, 2003
2. Satellite Communications Engineering – Wilbur L. Pritchard, Robert A Nelson and Henri G.Suyderhoud Pearson Publications, 2nd Edition, 2003.

Reference Books

1. Satellite Communications : Design Principles - M. Richharia, BS Publications, 2rd Edition, 2003
2. Satellite Communication - D.C Agarwal, Khanna Publications, Mc.Graw Hill, 5th Edition, 2008.
3. Fundamentals of Satellite Communications – K.N. Raja Rao, PHI, 2004.
4. Satellite Communications – Dennis Roddy, McGraw Hill, 2nd Edition, 1996

e- Resources & other digital material

1. <https://nptel.ac.in/courses/117/105/117105131/3>. <https://nptel.ac.in/courses/108/105/108105159/>
