

20EC2702B - SATELLITE COMMUNICATIONS

Offering Branches	ECE		
Course Category:	Open Elective -IV	Credits:	3
Course Type:	Theory	Lecture-Tutorial-Practical:	3-0-0
Prerequisites:		Continuous 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.	K2
CO2	Analyze the satellite orbits and link design for transmission & reception of signals	K4
CO3	Analyze various satellite subsystems and its functionality.	K4
CO4	Choose appropriate multiple access technique for a given satellite communication application.	K3

Contribution of Course Outcomes towards achievement of Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2									1				1
CO2		3								2				2
CO3		3								2				2
CO4	2									2				2
Avg.	2	3								2				2

1- Low

2-Medium

3-High

Course Content

UNIT-1	Introduction : Historical Back-ground, Basic Concepts of Satellite Communications, Frequency allocations for Satellite Services, Applications.	CO1
UNIT-2	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
UNIT-3	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
UNIT-4	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
UNIT-5	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	<ol style="list-style-type: none"> Satellite Communications – Timothy Pratt, Charles Bostian and Jeremy Allnutt, WSE, Wiley Publications, 2nd Edition, 2003. Satellite Communications Engineering – Wilbur L. Pritchard, Robert A Nelson and Henri G.Suyderhoud Pearson Publications, 2nd Edition, 2003.
Reference Books	<ol style="list-style-type: none"> Satellite Communications : Design Principles - M. Richharia, BS Publications, 2nd Edition, 2003.

	<ol style="list-style-type: none">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	<ol style="list-style-type: none">1. https://nptel.ac.in/courses/117/105/117105131/3.https://nptel.ac.in/courses/108/105/108105159/