

## SATELLITE COMMUNICATIONS

<b>Course Code</b>	20EC2702 B	<b>Year</b>	IV	<b>Semester</b>	I
<b>Course Category</b>	OE-III	<b>Branch</b>	ECE	<b>Course Type</b>	Theory
<b>Credits</b>	3	<b>L-T-P</b>	3-0-0	<b>Prerequisites</b>	--
<b>Continuous Internal Evaluation:</b>	30	<b>Semester End Evaluation:</b>	70	<b>Total Marks:</b>	100

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<b>Course Outcomes</b>	
Upon successful completion of the course, the student will be able to	
<b>CO1</b>	<b>Illustrate</b> the basic concepts of satellite communication and different Frequency allocations for satellite services. (L2)
<b>CO2</b>	<b>Analyze</b> the satellite orbits and link design for transmission & reception of signals (L4)
<b>CO3</b>	<b>Analyze</b> various satellite subsystems and its functionality. (L4)
<b>CO4</b>	<b>Choose</b> appropriate multiple access technique for a given satellite communication application (L3)

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<b>Contribution of Course Outcomes towards achievement of Program Outcomes &amp; Strength of correlations</b>														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
<b>CO1</b>	√									√				√
<b>CO2</b>		√								√				√
<b>CO3</b>		√								√				√
<b>CO4</b>	√									√				√

<b>Syllabus</b>		
<b>Unit No.</b>	<b>Contents</b>	<b>Mappe d CO</b>
I	<b>Introduction:</b> Historical Back-ground, Basic Concepts of Satellite Communications, Frequency allocations for Satellite Services, Applications.	CO1
II	<b>Orbital Mechanics And Launchers:</b> Orbital Mechanics, Look Angle determination, Orbital perturbations, Orbit determination, launches and launch vehicles, Orbital effects in communication systems performance.	CO1, CO2
III	<b>Satellite Subsystems:</b> Attitude and orbit control system, telemetry, tracking, Command and monitoring, power systems, communication subsystems, Satellite antenna Equipment reliability and Space qualification.	CO1, CO3
IV	<b>Satellite Link Design:</b> 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	<b>Multiple Access:</b> 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

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<b>Learning Resources</b>
<b>Text Books</b>
1. Satellite Communications – Timothy Pratt, Charles Bostian and Jeremy Allnut, WSE, Wiley Publications, 2 <sup>rd</sup> Edition, 2003 2. Satellite Communications Engineering – Wilbur L. Pritchard, Robert A Nelson and Henri G.Snyderhoud Pearson Publications, 2 <sup>nd</sup> Edition, 2003.
<b>Reference Books</b>
1. Satellite Communications : Design Principles - M. Richharia, BS Publications, 2 <sup>rd</sup> Edition, 2003 2. Satellite Communication - D.C Agarwal, Khanna Publications, Mc.Graw Hill, 5 <sup>th</sup> Edition, 2008. 3. Fundamentals of Satellite Communications – K.N. Raja Rao, PHI, 2004. 4. Satellite Communications – Dennis Roddy, McGraw Hill, 2 <sup>nd</sup> Edition, 1996
<b>e- Resources &amp; other digital material</b>
1. <a href="https://nptel.ac.in/courses/117/105/117105131/3">https://nptel.ac.in/courses/117/105/117105131/3</a> . <a href="https://nptel.ac.in/courses/108/105/108105159/">https://nptel.ac.in/courses/108/105/108105159/</a>

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