

Course Number and Name												
BEC003 - SATELLITE COMMUNICATION												
Credits and Contact Hours												
3 and 45												
Course Coordinator's Name												
Mr Sethupriyan												
Text Books and References												
TEXT BOOK:												
1. Dennis Roddy, "Satellite Communication", 4th Edition, Mc Graw Hill International, 2006.												
REFERENCES:												
1. Wilbur L. Pritchard, Hendri G. Suyderhoud, Robert A. Nelson, "Satellite Communication Systems Engineering", Prentice Hall/Pearson, 2007.												
2. N. Agarwal, "Design of Geosynchronous Space Craft", Prentice Hall, 1986.												
3. Bruce R. Elbert, "The Satellite Communication Applications", Hand Book, Artech House Boston London, 1997.												
4. Tri T. Ha, "Digital Satellite Communication", II nd edition, 1990.												
5. Emanuel Fthenakis, "Manual of Satellite Communications", Mc Graw Hill Book Co., 1984.												
6. Robert G. Winch, "Telecommunication Trans Mission Systems", Mc Graw-Hill Book Co., 1983.												
7. Brian Ackroyd, "World Satellite Communication and earth station Design", BSP professional Books, 1990.												
8. G.B. Bleazard, "Introducing Satellite communications", NCC Publication, 1985.												
9. www.sac.gov.in/SACSITE/Satcom_Overview.doc												
Course Description												
<ul style="list-style-type: none"> To enable the student to become familiar with satellites and satellite services. Study of satellite orbits and launching. Study of earth segment and space segment components Study of satellite access by various users. 												
Prerequisites						Co-requisites						
Communication Engineering – I & II						Nil						
required, elective, or selected elective (as per Table 5-1)												
Selected Elective												
Course Outcomes (COs)												
CO1: Define orbital mechanics and launch methodologies												
CO2 : Describe satellite subsystems												
CO3 : Design link power budget for satellites												
CO4 : Compare competitive satellite services												
CO5: Explain satellite access techniques												
CO6 : DTH and compression standards												
Student Outcomes (SOs) from Criterion 3 covered by this Course												
	COs/SOs	a	b	c	d	e	f	g	h	i	j	k
	CO1	H		M		M	M	M	H	M		L
	CO2	M	L	H				H		L	H	
	CO3	M	H	M				M	M	M		H
	CO4	M	H	H		M				M		M
	CO5		L			M	M	M		L		M
	CO6				M	M	H	M				

List of Topics Covered**UNIT I INTRODUCTION****9**

Introduction, Types – Active and Passive Satellite, Frequency allocation, Satellite orbits, Kepler's laws, Definitions of terms for earth-orbiting Satellites, Apogee and Perigee heights, Orbit Perturbations, Geo stationary orbit, Antenna look angles, Limits of visibility, Earth Eclipse of Satellite, Sun transit outage, launching orbits.

UNIT II THE SPACE SEGMENT**9**

Introduction, The Power supply, Attitude control, Spinning satellite stabilization, Momentum Wheel Stabilization, Station keeping, Thermal control, TT&C subsystem, Transponders, The Wide Band receiver, The Input Demultiplexer, The Power Amplifier, The Antenna subsystem.

UNIT III THE EARTH SEGMENT AND ANTENNAS**9**

Transmit receive earth station subsystems, up-converters-High Power Amplifier-Receive chain-LNA&LNB. TVRO earth station, The isotropic radiator and antenna gain, Horn antenna, The Parabolic reflector, Double reflector antenna-Cassegrain antenna-Gregorian antenna.

UNIT IV THE SPACE LINK & SATELLITE ACCESS**9**

EIRP, Transmission losses The Link budget equation, System noise, Effects of rain, up link and down link C/N ratio. Multiple access techniques-Concepts and types of TDMA, FDMA and CDMA-Comparison and contrast of TDMA, FDMA and CDMA.

UNIT V SATELLITE APPLICATIONS**9**

Satellite Mobile services, DBS, VSAT, Remote sensing, GPS, INTELSAT, INMARSAT, SARSAT, Video Conferencing and Internet connectivity