



National Institute of Technology Meghalaya
An Institute of National Importance

CURRICULUM

Programme	Bachelor of Technology in Electronics and Communication Engineering	Year of Regulation	2018-19
Department	Electronics and Communication Engineering	Semester	VII

Course Code	Course Name	Credit Structure				Marks Distribution				
		L	T	P	C	INT	MID	END	Total	
EC 427	Satellite Communication	3	0	0	3	50	50	100	200	
Course Objectives	To understand the fundamentals of satellite communication and its parameters	Course Outcomes	CO1	Able to acquire the knowledge about fundamentals of satellite communication and its parameters						
	To understand the concepts of satellite orbits and trajectories		CO2	Able to understand the basic concepts of satellite orbits and trajectories						
	To understand basics of satellite launch vehicle, subsystem and earth station		CO3	Able to understand basics of satellite launch vehicle, subsystem and earth station						
	To understand various of multiple accesses techniques		CO4	Able to understand various multiple accesses techniques						

No.	COs	Mapping with Program Outcomes (POs)												Mapping with PSOs			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
1	CO1	3	3	2	2	1	-	-	-	-	-	-	-	3	2	2	-
2	CO2	3	3	2	2	1	-	-	-	-	-	-	-	3	2	2	-
3	CO3	3	3	2	2	1	-	-	-	-	-	-	-	3	2	2	-
4	CO4	3	3	2	2	1	-	-	-	-	-	-	-	3	2	2	-
5	CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SYLLABUS

No.	Content	Hours	COs
I	Introduction & fundamental parameters: Historical background, Basic concepts, Frequency allocation for satellite services, orbital & spacecraft problems, comparison of networks and services, modulation techniques used for satellite communication	09	CO1 & CO2
II	Satellite orbits and trajectories: Two body problem, orbital mechanics, Orbital parameters, geostationary orbit, change in longitude, orbital maneuvers, orbital transfer, orbital perturbations, Injection velocity and satellite trajectory, Types of Satellite orbits, Orbital perturbations, Satellite stabilization, Orbital effects on satellite's performance, Eclipses, Look angles: Azimuth angle, Elevation angle	12	CO1 & CO2
III	Satellite launch vehicle: Launch Vehicles- principles of Rocket propulsion, powered flight, Launch vehicles for communication satellite Satellite subsystem: Power supply subsystem, Attitude and Orbit control, Tracking, Telemetry and command subsystem, Payload. Earth station: Types of earth station, Architecture, Design considerations, Testing, Earth station Hardware, Satellite tracking	6	CO3
IV	Multiple accesses: Introduction, FDMA (No derivation), SCPC Systems, MCPC Systems, TDMA, CDMA, SDMA	6	CO4
Total Hours		33	

Essential Readings

1. D. Roddy, "Satellite Communications", Tata- MacGraw Hill, 4th Edition, 2017.
2. T. Pratt, C. Bostian, J. Allnutt, "Satellite Communications", John Wiley & Sons, 2nd Edition, 2006.
3. W.L. Pritchard, H. G. Suyderhoud, R. A. Nelson, "Satellite Communications Systems Engineering", Prentice-Hall, 4th Edition, 2008.

Supplementary Readings

1. A. K. Maini, V. Agrawal, "Satellite Technology: Principles and Applications", John Wiley & Sons, 2nd Edition, 2011.
2. P. Banerjee, "Antennas and Wave Propagation", Pearson Education, PHI, 1st Edition, 2017.