

PANIPAT INSTITUTE OF ENGINEERING & TECHNOLOGY
Department of Electronics & Communication Engineering

LESSON PLAN

Subject Name: -Satellite Communication
Year: - 4th

Subject Code: - ECP-24A
Semester: - 8th

Lecture No	Unit No	Topic	COs Covered
L 1	UNIT-I	UNIT-I: SATELLITE ORBITS: Orbital Mechanics- Kepler's laws	CO1
L 2		locating the satellite in the Orbit, locating the satellite with respect to the earth	
L 3		Orbital elements, look angle determination, Sub satellite point, Azimuth and elevation angle calculation	
L 4		Orbital perturbations	
L 5		Longitudinal and Inclination changes	
L 6		Launches and launch vehicles-ELV's	
L 7		Placing the satellite into geostationary orbit	
L 8		Doppler shift, range variations	
L 9		solar eclipse, sun transit outage.	
L-10		Numerical problems	
L 11	UNIT-II	Unit -II: COMMUNICATION SATELLITES: Satellite Subsystems	CO2
L 12		Attitude and Orbit Control system (AOCS)	
L 13		Telemetry, Tracking	
L 14		Command and Monitoring	
L 15		Power System	
L 16		Communication Subsystems-description	
L 17		Transponders	
L 18		satellite antennas-basic antenna types	
L 19		basic antennas in practice	
L 20		Numerical Problems	
L 21		Revision	
L 22	UNIT-III	Unit -III: Satellite link design and Satellite access: Basic transmission theory	CO3
L 23		system noise temperature and G/T ratio	
L 24		Downlink design-link budget	

L 25		Uplink design	
L 26		design for specified C/N	
L 27		uplink and downlink attenuation in rain	
L 28		communication link design procedure	
L 29		system design examples	
L 30	UNIT- IV	Unit –IV:Multiple access schemes: FDMA	CO4
L 31		TDMA, CDMA	
L 32		DAMA; VSAT systems-basic techniques	
L 33		VSAT earth station engineering, system design	
L 34		DBS systems-C-band and Ku band home TV	
L 35		digital DBS	
L 36		satellite mobile systems; GPS	
L 37		Revision	

Text Books:

1. Timothy Pratt, Satellite Communications, Wiley India edition

Reference Books:D

2. Anil K Maini, Satellite Communication, Wiley India edition.

3. Siegmund M. Redl, Mathias K. Weber, Malcolm W. Oliphant, “An Introduction to GSM”, Artech House Publishers, 1995.

4. Kraus, J.D., “Antennas”, II Edition, John Wiley and Sons, NY, 1977. 5. Collin, R.E. and Zucker, F., - “Antenna theory: Part I”, Tata McGraw Hill, NY, 1969.

Web resources:

- <https://archive.nptel.ac.in/noc/courses/noc16/SEM2/noc16-ec10/>
- <https://archive.nptel.ac.in/courses/117/105/117105131/>
- <https://www.sciencedirect.com/topics/physics-and-astronomy/satellite-communication>
- https://www.tutorialspoint.com/satellite_communication/satellite_communication_introduction.htm