

LESSON PLAN**Subject:** Satellite and RADAR Communication **Semester:** Fifth **Branch:** ET&T

Unit Number	Name of the Topic	No of Class Required	Remarks
Unit 1.0 Introduction of satellite communication	1.1 Need for satellite communication, Brief history of satellite Communication, Block diagram of satellite communication link	2	
	1.2 Frequency allocations for satellite services, uplink and downlink frequency, uplink and downlink frequency bands for various services	1	
	1.3 Types of satellite: active and passive, synchronous and non synchronous, Low earth orbit(LEO), Medium earth orbit(MEO) and Geostationary earth orbit(GEO) satellites	1	
	1.4 Satellite communication orbits and its advantages and disadvantages Present Indian Satellites Communication scenario	1	
	1.5 Quiz conduction, Doubt Class	1	
	1.6 Unit Test	1	
Unit 2.0 Orbital parameter and launching of satellite	2.1 Kepler's law of satellite motion, first, second and third law, Orbital parameters: apogee and perigee heights, Orbit perturbations, effects of a non-spherical earth, atmospheric drag	2	
	2.2 Basic terminologies related to satellite orbits and satellite: latitude, longitude, look angle, elevation angle, station keeping, propagation delay time, velocity and footprint, satellite time period	2	
	2.3 Effect of eclipse on satellite solar power setup	1	
	2.4 Mechanics of launching a synchronous satellite in brief	1	
	2.5 Quiz conduction, Doubt Class	1	
	2.6 Unit Test	1	
Unit 3.0 Satellite sub-systems	3.1 Space segment subsystem: Altitude and Orbit Control(AOC) Subsystem, Telemetry Tracking Commanding and Monitoring (TTCM) subsystem	2	
	3.2 Power and Antenna Subsystems, Transponders	1	
	3.3 Earth segment subsystem: earth station transmitter and earth station receiver block diagram, function and working	2	
	3.4 Link budget calculation: Power flux density, Antenna Gain, Transmission Losses, Earth Station Uplink, Satellite Downlink	1	
	3.5 Quiz conduction, Doubt Class	1	
	3.6 Unit Test	1	
Unit 4.0 Multiple Access Techniques and Satellite Applications	4.1 Time division multiple access, Frequency division multiple access, Code division multiple access, functions and applications	2	
	4.2 Satellite services: one way satellite communication link, two way communication satellite link, pre assigned and demand assigned technique	2	
	4.3 Satellite Applications: Earth observation, remote sensing, Weather forecast, DBS system, VSAT, MSAT, and GPS	3	

	4.6 Quiz conduction, Doubt Class	1	
	4.7 Unit Test	1	
Unit 5.0 RADAR Systems	5.1 Introduction: Basic principle of RADAR and SONAR, basic types of RADAR, working of RADAR, applications	2	
	5.2 RADAR range equation and examples, factors affecting maximum range.	1	
	5.3 Pulse RADAR: block diagram, RADAR antenna, scanning and tracking methods, display methods	2	
	5.4 Continuous Wave (CW), Doppler RADAR: Moving target indicator radar, Blind speed, frequency modulated CW RADAR	3	
	5.5 Quiz conduction, Doubt Class	1	
	5.6 Unit Test	1	
Total Class Required		42	

Expend