Department of Electronics & Telecommunication Engineering
Lecture Plan

Subject Code: EC45759
Subject Name: Satellite and Radar Communication
Session: Jan-May 2024 Semester: VIII

Lecture No.	Topic to be cover
1.	Introduction of Communication systems, Need for space communication, advantage and disadvantages, Types of satellites
2.	Frequency band for satellite communication and types of links, Components of Satellite communications
3.	Types of satellite orbits and their terminology.
4.	Kepler's laws of Planetary motion
5.	Numerical on Law of time, velocity of orbit calculations, Types of Day.
6.	Types of satellite orbits, Satellite orbit terminology, Range and Look angle
7.	Launch vehicles and it working principle, Orbit perturbations, Orbit effect on Communication system
8.	Satellite Subsystems and its working
9.	Payload types and Transponders working,
10.	Bath tub curve and antenna used for satellite communications systems,
11.	Review of topics from 1st unit, Introduction of satellite link design
12.	Derivation for EIRP calculation, General architecture of satellite systems and EIRP calculations
13.	Types of losses and Noise calculations in the satellite link,
14.	Noise calculation and C/N for uplink and downlink
15.	Numerical on link budget calculations, Earth station and its types
16.	Subsystems of earth stations, Antenna system, Spacing in orbit
17.	Tracking systems, and Multiple access techniques, Trade off exercise
18.	Multiple access techniques, DAMA, SDMA and numerical
19.	Introduction of GPS and Satellite navigation system
20.	Architectural components of Satellite navigation and GPS. Position estimation and Ranging.
21.	Time estimation, GNSS signal model. Navigation message frame format,
22.	Type of errors and its effects on measurement. DoP and DGPS
23.	GPS Constellation of satellite, Comparison of various Navigation Systems
24.	Introduction of Satellite application and VSAT, VSAT architecture and DSB Systems,

25.	Introduction of RADAR Systems, Its types and configuration
26.	Terminology of Radar system, radar range equations
27.	Numerical on radar range equation
28.	Types of radar, MTI radar and CW radar system
29.	Delay line canceller and Tracking
30.	Radar display and its types