Bhoj Reddy Engineering College for Women: Hyderabad

Department of Electronics and Communication Engineering

Lesson plan of faculty member for the academic year 2017–18

Class: IV B Tech Branch-Section: ECE-C Semester: II

Subject: Satellite Communications Lectures per week: 3+1 (Tutorial)

Lecture Number	Topics to be covered	Date (s)
UNIT – I: Communication Satellite: Orbit and Description		
1	A brief history of Satellite Communication, Satellite Frequency Bands	22 December 2017
2	Satellite Systems, Applications	22 December 2017
3	Orbital Period and velocity	23 December 2017
4	Tutorial (G1, G3, G2) - Problems on Orbital Period and Velocity	21,22,23 December 2017
5	Effects of Orbital Inclination	29 December 2017
6	Azimuth and Elevation	29 December 2017
7	Coverage angle and slant range	30 December 2017
8	Tutorial (G1, G3, G2) - Problems on Azimuth and Elevation	28,29,30 December 2017
9	Eclipse, Orbital Perturbations	5 January 2018
10	Placement of a satellite in a Geo-Stationary orbit	5 January 2018
UNIT-II: Satellite Sub-Systems & Satellite Link		
11	Attitude and Orbit Control Systems	6January 2018
12	Tutorial (G1, G3, G2) - Problems on AOCS	4,5,6 January 2018
13	TT&C subsystem	12 January 2018
14	Power Systems and Communication Subsystems	12 January 2018
15	Satellite Antenna Equipment	13 January 2018
16	Tutorial (G1, G3,G2) - Problems on satellite link equation	11,12,13 January 2018
17	Basic Transmission Theory	19 January 2018
18	Satellite Link Equation Derivation*	19 January 2018
19	System Noise Temperature and G/T Ratio	20 January 2018
20	Tutorial (G1, G3, G2) - Problems on G/T and C/N ratios and up and down links	18,19,20 January 2018
21	Basic Link Analysis, Interference Analysis	27 January 2018
22	Tutorial (G1, G2) - Problems on G/T and C/N ratios and up and down links	25,27 January 2018
23	Design of Satellite Links for a specified C/N (with and without frequency re-use)	2 February 2018
24	Link Budget	2 February 2018
UNIT-III:Propagation Effects & Multiple Access		
25	Introduction, Atmosphereic Absorption, Cloud Attenuation	3 February 2018
26	Tutorial (G1, G3,G2) - Problems Link budget	1,2,3 February 2018
27	Tropospheric and Ionospheric Scintillation	10 February 2018
28	Tutorial (G2) - Problems Link budget	10 February 2018
29	low angle fading, Rain Induced attenuation	16February 2018
30	rain induced cross polarization interference	16 February 2018
31	Frequency Division Multiple Access (FDMA)	17 February 2018
32	Tutorial (G1, G3,G2) - Problems on link design	15,16,17 February 2018
33	Intermodulation, Calculation of C/N	23 February 2018
34	Time Division Multiple Access (TDMA) - Frame Structure	23 February 2018
35	Burst structure	24 February 2018
36	Tutorial (G1, G3, G2) - Problems on link design	22,23,24 February 2018
37	Satellite Switched TDMA and On board Processing	2 March 2018
38	Demand Access Multiple Access (DAMA) – Types of demand assignment, Characteristics	2 March 2018
39	Code Division Multiple Access (CDMA), Spread Spectrum	3 March 2018

	Transmission and Reception.	
40	Tutorial (G3, G2) - Problems on TDMA	2,3 March 2018
UNIT-IV: **Earth Station Technology & Satellite Navigation and Global Positioning System**		
41	Transmitters	9 March 2018
42	Receivers	9 March 2018
43	Antennas	10 March 2018
44	Tutorial (G1, G3, G2) - Problems on CDMA	8,9,10 March 2018
45	Tracking Systems and Terrestrial Interface	16 March 2018
46	Primary Power Test Methods	16 March 2018
47	Lower Orbit Considerations	17 March 2018
48	Tutorial (G1, G3, G2) - Earth Station Antennas	15,16,17 March 2018
49	Radio and satellite Navigation	23 March 2018
50	GPS Position Location Principles, GPS Receivers	23 March 2018
51	GPS C/A Code Accuracy and Differential GPS	24 March 2018
52	Tutorial (G1,G3, G2) - Problems on satellite orbits	22,23,24 March 2018
UNIT-V: **Satellite Packet Communications**		
53	Transmission by FDMA:M/G/1 Queue	24 March 2018
54	Message Transmission by TDMA, PURE ALOHA	31 March 2018
55	Satellite Packet Switching, Slotted Aloha, Tree Algorithm	31 March 2018
56	Tutorial (G1, G2) - Tree Algorithm	29,31March 2018

Text books:

1. Timothy Pratt, Charles Bostian and Jeremy Allnutt, “Satellite Communications”, WSE Wiley Publications, 2nd Edition, 2003.
2. Wilbur L Pritchard, Robert A Nelson and Henri G. Suyderhoud, “Satellite Communications Engineering”, 2nd Edition, Pearson Publications, 2003.
3. Tri T Ha, “Digital Satellite Communications”, Mc Graw Hill, 2nd Edition, 1990.

Name and signature of the faculty: Dr.J Madhavan ----

Name and signature of Head of the Department: Ms N Shribala ----