Bhoj Reddy Engineering College for Women: Hyderabad

Department of Electronics and Communication Engineering

Lesson plan of faculty member for the academic year 2018–19

Class: III B Tech Branch-Section: ECE-A Semester: II

Subject: Antennas and Wave Propagation Lectures per week: 4

Lecture Number	Topics to be covered	Date (s)
	UNIT – I: Antenna Basics	
1	Introduction, Basic Antenna Parameters	24 December 2018
2	Basic antenna parameters	27 December 2018
3	Beam Area, Gain	
4	Radiation Intensity , Beam Efficiency	29 December 2018
5	Directivity, Gain and Resolution	31 December 2018
6	Antenna Apertures, Effective Height	2 January 2019
7	Fields from oscillating dipole	3 January 2019
8	Field zones, Front-to-back ratio	
9	Problems on gain n directivity	5 January 2019
10	Antenna theorems	7 January 2019
11	Radiation, Retarded potentials	9 January 2019
12	Helmholtz theorem.	10 January 2019
13	Radiation from Small Electric Dipole	
14	Quarter wave Monopole	12 January 2019
15	Half wave Dipole – Current Distributions, Field Components	16 January 2019
16	Radiated power, Radiation Resistance ,Directivity, Beam Width	17 January 2019
17	Problems on radiation resistance	
18	Effective Area and height, Natural current distributions, field patterns of Thin Linear Center-fed antennas of different lengths	19 January 2019
19	Loop Antennas : Small Loops	21 January 2019
20	Field Components, Comparison of a small loop and short dipole	23 January 2019
21	Radiation resistance and directives of small loops	24 January 2019
22	Problems on radiation resistance	
	UNIT-II: **VHF,UHF and Microwave antennas-I**	
23	Arrays with Parasitic Elements, Yagi Uda array	28 January 2019
24	Folded dipole and their characteristics	30 January 2019
25	Helical Antennas, Significance, Geometry	31 January 2019
26	Problems on dipoles	
27	Helix modes	2 February 2019
28	Practical design considerations for monofilar helical in Axial mode and Normal modes	4 February 2019
29	Horn antennas-types	6 February 2019
30	Fermat's principle, Optimum Horns	7 February 2019
31	Problems	
32	Design considerations of Pyramidal Horns,	9 February 2019
33	Problems	11 February 2019
	UNIT-III: **VHF,UHF and Microwave antennas-II**	
34	Introduction to Microstrip Antennas	13 February 2019
35	Features, advantages, limitations	14 February 2019
36	Rectangular patch antennas-Geometry and parameters	16 February 2019
37	Problems	
38	Characteristics of Microstrip antennas	18 February 2019
39	Reflector Antennas : Flat Sheet and Corner Reflectors	20 February 2019
40	Paraboloidal reflectors-geometry	21 February 2019
41	Problems	
42	Patterns, Characteristics, Feed methods	23 February 2019
43	Reflector types	25 February 2019

Lecture Number	Topics to be covered	Date (s)
44	Related features	27 February 2019
	UNIT-IV: **Antenna Arrays**	
45	Point sources-definition, patterns	28 February 2019
46	Problems	
47	Arrays of 2 Isotropic sources-different cases,	2 March 2019
48	Principles of pattern multiplication	6 March 2019
49	Uniform linear arrays: Broadside	7 March 2019
50	End fire arrays	
51	Derivation of Characteristics, Comparison, EFA with Increased Directivity	9 March 2019
52	Problems on antenna arrays BSA	
53	BSA with non uniform amplitude distributions, General considerations and binomial arrays	11 March 2019
54	Antenna measurements arrangements, Near and far fields	13 March 2019
55	Coordinate system, Source of errors	14 March 2019
56	Patterns to be measured	
57	Directivity and Gain Measurements	16 March 2019
58	Problems on antenna arrays	
	UNIT-V: **Wave propagation-I,II**	
59	Definitions, Categorizations and General classifications	18 March 2019
60	Different modes of wave propagation, Ray/Mode concepts.	20 March 2019
61	Ground Wave Propagation, Wave Tilt, Curved Earth Reflections	23 March 2019
62	Space wave propagation, Field strength variation with distance and height	25 March 2019
63	plane earth reflections, Space and Surface waves	27 March 2019
64	Effect of earth's curvature, Absorption	28 March 2019
65	Super refraction, Duct propagation	
66	Scattering phenomenon, M-curves	30 March 2019
67	Tropospheric propagation, fading and path loss calculations	1 April 2019
68	Sky wave propagation	
69	structure of Ionosphere	3 April 2019
70	Ray path, Critical frequency MUF	4 April 2019
71	LUF,OWF ,Virtual height Multihop communication,	
72	Multihop communication	8 April 2019
73	Virtual height	10 April 2019
74	Multi-hop propagation	
75	Skip distance	11 April 2019
76	Relation between MUF and skip distance	
77	Problems on LUF and MUF	13 April 2019
78	Problems on skip distance and critical frequency	15 April 2019
79	Revision	17 April 2019
80	Revision	20 April 2019

Text books:

1. Antennas and Wave Propagation – J.D. Kraus, R.J. Marhefka and Ahmad S. Khan, MC GRAW HILL EDUCATION, New Delhi, 4th ed., (Special Indian Edition), 2010.
2. Electromagnetic Waves and Radiating Systems – E.C. Jordan and K.G. Balmain, PHI, 2nd ed., 2000.
3. Antenna Theory - C.A. Balanis, John Wiley & Sons, 3rd Ed., 2005.
4. Antennas and Wave Propagation – K.D. Prasad, Satya Prakashan, Tech India Publications, New Delhi, 2001.

Name and signature of the faculty: Ms Rayeekanti Radhika ----

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