

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: III B Tech

Branch-Section: ECE-A

Semester: I

Subject: Antennas and Wave Propagation

Lectures per week: 4+1 (Tutorial)

Lecture Number	Topics to be covered	Date (s)
<b>UNIT – I: Antenna Basic</b>		
1	Introduction, Basic Antenna Parameters	12 July 2017
2	Radiation Patterns, Beam Area	13 July 2017
3	Radiation Intensity , Beam Efficiency	14 July 2017
4	Tutorial (G2,G1) - Problems related to Antenna Parameters	14,15 July 2017
5	Directivity, Gain and Resolution	19 July 2017
6	Antenna Apertures, Effective Height	20 July 2017
7	Fields from oscillating dipole	21 July 2017
8	Tutorial (G3, G2, G1) - Problems related to Antenna Parameters	18, 21, 22 July 2017
9	Field zones, Antenna Temperature, Front-to-back ratio	24 July 2017
10	Antenna theorems	26 July 2017
11	Radiation, Retarded potentials	27 July 2017
12	Helmholtz theorem.	28 July 2017
13	Tutorial (G3, G2, G1) - Problems related to Antenna Parameters	25, 28, 29 July 2017
14	Radiation from Small Electric Dipole, Quarter wave Monopole	31 July 2017
15	Half wave Dipole – Current Distributions, Evaluation of Field Components	2 August 2017
16	Radiated power, Radiation Resistance ,Directivity, Beam Width	3 August 2017
17	Effective Area and height, Natural current distributions, field patterns of Thin Linear Center-fed antennas	4 August 2017
18	Tutorial (G3, G2, G1) - Problems related to monopole and dipole	1, 4, 5 August 2017
19	Loop Antennas : Small Loops	7 August 2017
20	Field Components, Comparison of a small loop and short dipole	9 August 2017
21	Concept of short magnetic dipole, D and R <sub>r</sub> relations for small loops	10 August 2017
22	large loop Antennas	11 August 2017
23	Tutorial (G3, G2, G1) - Problems related to Loop Antennas	8,11,12 August 2017
<b>UNIT-II: VHF,UHF and Microwave antennas-I</b>		
24	Arrays with Parasitic Elements, Yagi Uda array	16 August 2017
25	Folded dipole and their characteristics	17 August 2017
26	Helical Antennas, Significance, Geometry	18 August 2017
27	Tutorial ( G2, G1) - Problems related to Yagiuda, Helical Antennas	18,19 August 2017
28	Helix modes	21 August 2017
29	Practical design considerations for monofilar helical in Axial mode and Normal modes	23 August 2017
30	Horn antennas-types	24 August 2017
31	Tutorial (G3,G1) - Problems related to Horn Antennas	22,26 August 2017
32	Fermats principle, Optimum Horns	28 August 2017
33	Design considerations of Pyramidal Horns,	30 August 2017
<b>UNIT-III: VHF,UHF and Microwave antennas-II</b>		
34	Introduction to Microstrip Antennas	31 August 2017
35	Features, advantages, limitations	1 September 2017
36	Tutorial (G3, G2) - Problems related to Microstrip Antennas	29 August, 1 September 2017
37	Rectangular patch antennas-features, Impact of different parameters on characteristics	4 September 2017
38	Tutorial (G3, G1) - Problems related to Microstrip Antennas	5,9 September 2017
39	Reflector Antennas : Flat Sheet and Corner Reflectors	11 September 2017

40	Paraboloidal reflectors-geometry	13 September 2017
41	Patterns, Characteristics, Feed methods	14 September 2017
42	Reflector types	15 September 2017
43	Tutorial ( G3, G2, G1) - Problems related to Reflector Antennas	12,15,16 September 2017
44	Lens antennas, Geometry, Features	18 September 2017
45	Non metallic dielectric lenses	21 September 2017
46	Zoning, Applications	22 September 2017
47	Tutorial ( G3, G2, G1) - Problems related to Lens Antennas	19,22,23 September 2017
<b>UNIT-IV: Antenna Arrays</b>		
48	Point sources-definition, patterns	4 October 2017
49	Arrays of 2 Isotropic sources-different cases,	5 October 2017
50	Principles of pattern multiplication	6 October 2017
51	Tutorial (G3, G2, G1) - Problems related to Array Antennas	3,6,7 October 2017
52	Broadside, Endfire arrays	9 October 2017
53	Derivation of Characteristics, Comparision, EFA with Increased Directivity	11 October 2017
54	BSA with non uniform amplitude distributions, General considerations and binomial arrays	12 October 2017
55	Antenna measurements arrangements, Reciprocity, Near and far fields	13 October 2017
56	Tutorial (G3, G2, G1) - Problems related to EFA, BFA	10,13,14 October 2017
57	Coordinate system, Source of errors, Patterns to be measured	16 October 2017
58	Pattern measurements, Directivity and Gain Measurements	19 October 2017
<b>UNIT-V: Wave propagation-I,II</b>		
59	Definitions, Categorizations and General classifications	20 October 2017
60	Tutorial (G3, G2, G1) - Problems related to Antenna Measurements	17,20,21 October 2017
61	Different modes of wave propagation, Ray/Mode concepts.	23 October 2017
62	Ground Wave Propagation, Wave Tilt, Curved Earth Reflections	25 October 2017
63	Space wave propagation, Field strength variation with distance and height	26 October 2017
64	plane earth reflections, Space and Surface waves	27 October 2017
65	Tutorial (G3, G2, G1) - Problems related to Ground wave Prop.	24,27,28 October 2017
66	Effect of earth's curvature, Absorption, Super refraction	30 October 2017
67	Duct propagation, Scattering phenomenon, M-curves,	1 November 2017
68	Tropospheric propagation, fading and path loss calculations	2 November 2017
69	Sky wave propagation , structure of Ionosphere, Ray path, Critical frequency	3 November 2017
70	Tutorial (G3, G2, G1) - Problems related to Surface wave Prop.	31 October, 3,4 November 2017
71	MUF, LUF,OWF, Multihop communication, Virtual height,Relation between MUF and skip distance	6 November 2017
72	Tutorial (G3) - Problems related to Sky wave Propagation	7 November 2017

**Text books:**

1. J.D.Kraus,R.J.Marhefka and Ahmad S.Khan, TMH,4/e,2010
2. E.C.Jordan and K.G.Balmain,Electromagnetic radiating systems, PHI ,2/e, 2000

Name and signature of the faculty: Ms P.A.Sravanthi ----

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