SCIENT INSTITUTE OF TECHNOLOGY

IBRAHIMPATNAM, RANGAREDDY DISTRICT, T.S.-501506

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

LESSON PLAN

Academic Year : 2023-2024
Class & Semester : III YEAR & II SEM
Name of the Faculty member : G SWARNALATHA
Name of the subject : Antennas and Propagation

Course objectives:

- To learn radiation parameters like radiation pattern, gain, directivity etc..
- To derive the characteristics of the thin dipole and half wave dipole
- To distinguish between UHF ,VHF and MICROWAVE antennas characteristics
- To identify the antenna array requirements of BSA and EFA and its characteristics
- To understand the antenna measurement requirements
- To define and distinguish between different phenomenon of wave propagation.

Course outcomes:

- Explain the mechanism of radiation, distinguish between different antenna characteristic parameters,
- Distinguish between short dipoles, half-wave dipoles, quarter-wave monopoles and small loops, configure their current distributions.
- Characterize the antennas based on frequency, configure the geometry and establish the radiation patterns
- Analyze a micro strip rectangular patch antenna and a parabolic reflector antenna, identify the requirements.

S. No.	Unit No.	Date	Topic	No. of Periods	Cumulative periods
1	I	18/03/2024	**Antenna basics**:	1	1
2		19/03/2024	Introduction ,Basic antenna parameters-patterns	1	2
3		20/03/2024 21/03/2024	Beam area, radiation intensity , beam efficiency, directivity	2	4
4		22/03/2024	Gain, resolution, ,antenna aperture, An effective height -problems	1	5
5		23/03/2024	Fields from oscillating dipole FBR , antenna theorems retarded potentials	1	6
6		26/03/2024 27/03/2024	Thin linear wire antennas :radiation from small electric dipole	2	8
7		28/03/2024	half wave dipole -current distribution, field components	1	9
8		30/03/2024	radiated power radiation resistance	1	10
9		01/04/2024	beam width, directivity, effective area ,effective height	1	11
10		02/04/2024	Natural current distribution , far fields	1	12
11		08/04/2024	patterns of thin linear centre -fed antennas of different lengths-problems	1	13
12		10/04/2024	loop antennas -introduction ,small loop	1	14
13		12/04/2024	Comparison of far field of small loop and short dipole	1	15
14		15/04/2024	Radiation resistance and directivities of small loops	1	16
15		16/04/2024	**Class Test -1**	1	17
16	II	18/04/2024	Arrays with parasitic elements	1	18
17		19/04/2024	Yagi uda array , folded dipole	1	19
18		22/04/2024	their characteristics	1	20
19		23/04/2024	helical antenna- helical geometry	1	21
20		24/04/2024	helix modes	1	22

S. No.	Unit No.	Date	Topic	No. of Periods	Cumulative periods
21		25/04/2024	Practical design considerations for mono filar helical antenna in axial normal modes	1	23
22		26/04/2024	Horn antennas -types	1	24
23		27/04/2024	Fermat's principle , optimum horns	1	25
24		29/04/2024	Arrays with parasitic elements	1	26
25		30/04/2024	Yogi uda array,	1	27
26		01/05/2024	folded dipole their characteristics	1	28
27		02/05/2024	**Class Test -2**	1	29
28		03/05/2024	problems	1	30
29		04/05/2024	problems	1	31
30	III	06/05/2024	Micro strip antennas - introduction	1	32
31		09/05/2024	Features ,advantages, Limitations	1	33
32		10/05/2024	Micro strip antennas - introduction	1	34
33		11/05/2024	Features ,advantages, Limitations	1	35
		Mid tern-I & summer vacation			
35		29/05/2024	rectangular patch antennas ,	1	36
36		30/05/2024	Geometry and parameters, Characteristics of micro strip antennas	1	37
37		31/05/2024	Reflector antennas-introduction	1	38
38		03/05/2024	Flar sheet and corner reflector antennas	1	39
39		04/06/2024	Paraboloidal reflectors -geometry	1	40
40		05/06/2024	Pattern characteristics and feed methods	1	41
41		10/06/2024	Reflector types ,	1	42
42		11/06/2024	related features ,problems	1	43
43		12/06/2024	**Class Test -3**	1	44
44	IV	13/06/2024	Introduction ,point sources -definition patterns	1	45
45		14/06/2024	Arrays of 2 point isotropic sources, Different cases,	1	46
46		18/06/2024	principle of pattern multiplication	1	47
47		19/06/2024	Uniform linear arrays-broadside arrays	1	48
48		20/06/2024	Endfire arrays,	1	49
49		21/06/2024	EFA with increased directivity	1	50
50		24/06/2024	derivation of their characteristics -Comparison	1	51
51		25/06/2024	BSA with nonuniform amplitude distribution	1	52
52		26/06/2024	General considerations	1	53
53		27/06/2024	Binomial arrays -problems	1	54
54		28/06/2024	Antenna measurements: introduction	1	55
55		01/07/2024	Concepts-Reciprocity , near field and far field	1	56
56		02/07/2024	co-ordinate system, sources of errors	1	57
57		03/07/2024	Patterns to be measured :directivity measurement	1	58
58		04/07/2024	Gain measurement by comparison, absolute , 3-antenna method	1	59
59		05/07/2024	**Class Test -4**	1	60
60	V	08/07/2024 09/07/2024	Introduction Definitions, categorizations, General classifications	1	61
61		10/07/2024 11/07/2024	Different modes wave propagations, Ray/mode concepts, Ground wave propagation -introduction, pla earth reflection	1	62
62		15/07/2024 18/07/2024	Space Wave Propagation	1	63
63		16/07/2024	Field Strength Variation with Distance and Height	1	64
64		18/07/2024	Effect of Earth's Curvature	1	65
65		19/07/2024	Absorption, Super Refraction	1	66
66		22/07/2024	M-Curves and Duct Propagation	1	67

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67		23/07/2024	Scattering Phenomena	1	68
68		24/07/2024	Troposphere Propagation.	1	69
69		25/07/2024	Sky Wave Propagation –Structure of Ionosphere	1	70
70		26/07/2024	Field strength variation with distance and height	1	71
71		30/07/2024	sky wave propagation-introduction	1	72
72		31/07/2024	critical frequency , MUF,LUF,OF	1	73
73		01/08/2024	Virtual height, Skip distance, Multi-hop Propagation.	1	74
74		02/08/2024	**Class Test -5**	1	75

Principal