

# GOPALAN COLLEGE OF ENGINEERING AND MANAGEMENT

Department of Computer Science and Engineering

Academic Year: **2017-18**

Semester: **EVEN**

## COURSE PLAN

Semester: **VI**

Subject Code& Name: **10EC64 & Antennas & Propagation**

Name of Subject Teacher: **VISHALAKSHI B HIREMANI**

Name of Subject Expert (Reviewer): **KAVITHA M V**

For the Period: From: 06-02-17 to 02-06-17

### Details of Book to be referred:

Text Books	T1. <b>Antennas and Wave Propagation</b> , John D. Krauss, 4 <sup>th</sup> Edn, McGraw-Hill International edition, 2010. T2. <b>Antennas and Wave Propagation</b> - Harish and Sachidananda: Oxford Press 2007
Reference Books	R1. <b>Antenna Theory Analysis and Design</b> - C A Balanis, 3rd Edn, John Wiley India Pvt. Ltd, 2008 R2. <b>Antennas and Propagation for Wireless Communication Systems</b> - Sineon R Saunders, John Wiley, 2003. R3. <b>Antennas and wave propagation</b> - G S N Raju: Pearson Education 2005

Lecture NO	Topic Planned	Practical Applications, Brief objectives & Outcomes	Book referred with Pg No.	Planned Date	Executed Date	Deviation Reasons thereof	How Made Good / Reciprocate arrangement	Remarks by HOD
1.	Introduction to the subject			06-02-17				
2.	<b>UNIT-1 : ANTENNA BASICS:</b> Introduction	<b>Practical Applications:</b>	T1 8	07-02-17				

3.	basic Antenna parameters, patterns	<b>Wireless Communications</b> Sector Antenna for 2.4 GHz WiFi™ Designing a PIFA for WLAN WiFi™ Applications.  <b>Objectives</b> -To study radiation from a current element. -To study antenna arrays -To study aperture antennas  <b>Outcomes</b> -Understand the function of antennas - Evaluate the fundamental parameters of antennas and arrays operating at various frequencies from LF to Microwave applications	T1 9	08-02-17					
4.	beam area, radiation intensity		T1 15	09-02-17					
5.	beam efficiency		T1 18	10-02-17					
6.	Directivity and gain		T1 18	13-02-17					
7.	antenna apertures, effective height		T1 23,25	14-02-17					
8.	Bandwidth		T1 259	15-02-17					
9.	Radiation efficiency,		T1 48	16-02-17					
10.	antenna temperature		T1 44	20-02-17					
11.	antenna field zones		T1 33	21-02-17					
12.	Test on unit 1		T1	22-02-17					
13.	<b>UNIT - 2 POINT SOURCES AND ARRAYS: Introduction,</b>		<b>Practical Applications</b> Arrays may be used in various configurations for mobile communications	T1 86	23-02-17				
14.	point sources		<b>Objectives</b> -To study point sources	T1 86	27-02-17				
15.	power patterns,	-To study radiation from the endfire & broadside array	T1 87	28-02-17					
16.	power theorem,	<b>Outcomes</b> - Evaluate the	T1 89	01-03-17					
17.	radiation intensity,		T1 89	02-03-17					

18.	filed patterns	fundamental parameters of antennas and arrays operating at various frequencies from LF to Microwave applications	T1 95	03-03-17				
19.	phase patterns		T1 98	04-03-17				
20.	isotropic point sources		T1 100	06-03-17				
21.	Array of two isotropic point sources		T1 100	07-03-17				
22.	Endfire array and		T1 125,175	08-03-17				
23.	Broadside array		T1 125,175	13-03-17				
24.	Test on unit 2			14-03-17				
25.	<b>UNIT - 4 &amp; 5 LOOP, SLOT, PATCH AND HORN ANTENNA: Introduction</b>	<b>Practical Applications</b> aerospace and defense, communications, semiconductor industries	T1 246	15-03-17				
26.	small loop	<b>Objectives</b>	T1 246	16-03-17				
27.	comparison of far fields of small loop and short dipole	-To study small loop and short dipole - To study slot antenna	T1 248	17-03-17				
28.	loop antenna general case	-Related parameters	T1 248	20-03-17				
29.	far field patterns of circular loop	<b>Outcomes</b> -able to differentiate between loop and short dipole	T1 250	21-03-17				
30.	radiation resistance	-able to understand patch antennas, horn antennas	T1 253	22-03-17				
31.	Directivity		T1 255	23-03-17				

32.	slot antenna		T1 267	27-03-17				
33.	slot antenna		T1 267	28-03-17				
34.	Babinet's principle		T1 273	30-03-17				
35.	complementary antennas,		T1 273	31-03-17				
36.	complementary antennas,		T1 274	03-04-17				
37.	impedance of complementary		T1 276	04-04-17				
38.	impedance of complementary		T1 276	05-04-17				
39.	impedance of slot antennas		T1 278	06-04-17				
40.	patch antennas,		T1 477	07-04-17				
41.	patch antennas,		T1 477	10-04-17				
42.	horn antennas,		T1 283	11-04-17				
43.	rectangular horn antennas		T1 286	12-04-17				
44.	rectangular horn antennas		T1	13-04-17				
45.	Test on units 4 & 5			20-04-17				
46.	<b>UNIT - 7 &amp; 8 RADIO WAVE PROPAGATION:</b>	<b>Practical Applications</b> -To study radio wave propagation	T1 782	21-04-17				

	Introduction,	-Use of mobile phones, wifi internet, tv broadcasting, fm broadcasting all are in the wireless communication  <b>Objectives</b> -To understand different ways of propagation of radio waves  <b>Outcomes</b> -Identify the atmospheric and terrestrial effects on radio wave propagation. - Evaluate basic propagation models in mobile radio systems						
47.	Ground wave propagation,		T1 783	24-04-17				
48.	free space propagation		T1 799	25-04-17				
49.	ground reflection,		T1 783	26-04-17				
50.	surface wave,		T1 787	27-04-17				
51.	diffraction.		T1 788	28-04-17				
52.	<b>TROPOSPHERE WAVE PROPAGATION: Introduction</b>		T1 810	02-05-17				
53.	Troposcopic scatter,		T1 812	03-05-17				
54.	Ionosphere propagation		R3 405	04-05-17				
55.	electrical properties of the ionosphere,		R3 411	05-05-17				
56.	electrical properties of the ionosphere,		R3 411	06-05-17				
57.	effects of earth's magnetic field.	R3 422	08-05-17					
58.	effects of earth's magnetic field.	R3 422	09-05-17					
59.	<b>UNIT - 3 ELECTRIC DIPOLES AND THIN LINEAR ANTENNAS:</b> Introduction, short electric dipole,	<b>Practical Applications</b> VHF and UHF antennas  <b>Objectives</b> To study field patterns,	T1 156	10-05-17				

60.	fields of a short dipole(no derivation of field components),	radiation resistance, structure of electric dipoles and thin linear antennas <b>Outcomes</b> - Ability to design various types of linear and planar antennas	T1 157	11-05-17				
61.	radiation resistance of short dipole, radiation resistances of $\lambda/2$ Antenna,		T1 164	12-05-17				
62.	thin linear antenna, micro strip arrays, low side lobe arrays		T1 167	18-05-17				
63.	long wire antenna, folded dipole antennas		T1 227	19-05-17				
64.	<b>UNIT – 6</b> <b>ANTENNA TYPES:</b> Helical Antenna, Yagi-Uda array, corner reflectors, parabolic reflector	<b>Practical Applications</b> U.S. Navy’s ELF system -Operates at 76 Hz -80 miles of wire -Penetrates to underwater subs -One-way system <b>Objectives</b> To study different types of antennas in detail  <b>Outcomes</b> - Understand the different types of antennas and the radiation mechanism	T1 297	22-05-17				
65.	log periodic antenna, lens antenna, antenna for special applications – sleeve antenna		T1,R3 260,399	23-05-17				
66.	turnstile antenna, omni directional antennas,		R3 274,276	24-05-17				
67.	antennas for satellite antennas for ground penetrating radars,		T1 584,576	25-05-17				
68.	embedded antennas, ultra wide band antennas, plasma antenna		T1 586,436	26-05-17				
69.	Revision of unit1			29-05-17				

70.	Revision of unit2			30-05-17				
71.	Revision of unit4			31-05-17				
72.	Revision of unit5			01-06-17				
73.	Revision of unit7			02-06-17				

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