



Name of the Subject: EM Waves and Transmission Lines

Year & Sem: II/II

Dept: ECE – A, B&C

S.No	Planned date	Topic Planned	Classes Required	Cumulative Classes
1	20-11-2017	Review of Coordinate Systems	1	1
2	21-11-2017	Dot product, cross product. Scalar triple product, Vector triple product	1	2
3	22-11-2017	Vector Calculus, Divergence and Stoke's theorems	1	3
4	23-11-2017	UNIT - I Coulomb's Law, Electric Field Intensity Electric Flux Density	1	4
5	24-11-2017	Gauss Law and Applications, Electric Potential	1	5
6	25-11-2017	Maxwell's Two Equations for Electrostatic Fields	1	6
7	27-11-2017	Energy Density, Illustrative Problems.	1	7
8	28-11-2017	Convection and Conduction Currents, Dielectric Constant	1	8
9	29-11-2017	Continuity Equation, Relaxation Time	1	9
10	30-11-2017	Poisson's and Laplace's Equations; Capacitance – Parallel Plate	1	10
11	1-12-2017	Coaxial, Spherical Capacitors, Illustrative Problems	1	11
12	4-12-2017	Add On Topic(Co-ordinate systems)	1	12
13	5-12-2017	Problems	1	13
UNIT - II MAGNETOSTATICS				
14	6-12-2017	Biot-Savart Law	1	14
15	7-12-2017	Ampere's Circuital Law and Applications	1	15
16	8-12-2017	Magnetic Flux Density,	1	16
17	11-12-2017	Maxwell's Two Equations for Magneto static Fields	1	17
18	12-12-2017	Magnetic Scalar and Vector Potentials, Forces due to Magnetic Fields	1	18
19	13-12-2017	Ampere's Force Law, Inductances and Magnetic Energy.	1	19
20	14-12-2017	Related Problems	1	20
21	15-12-2017	Maxwell's Equations Faraday's Law and Transformer emf	1	21
22	16-12-2017	Inconsistency of Ampere's Law and Displacement Current Density, Maxwell's Equations in Different Final Forms and Word Statements.	1	22
23	18-12-2017	Conditions at a Boundary Surface: Dielectric Dielectric and Dielectric-Conductor Interfaces.	1	23
24	19-12-2017	Illustrative Problems.	1	24
25	20-12-2017	Add On Topic(Waves polarization)	1	25
UNIT – III EM WAVE CHARACTERISTICS – I				
26	21-12-2017	Wave Equations for Conducting and Perfect Dielectric Media	1	26
27	22-12-2017	Uniform Plane Waves – Definition,	1	27
28	23-12-2017	All Relations Between E & H	1	28
29	26-12-2017	Sinusoidal Variations.	1	29



30	27-12-2017	Wave Propagation in Lossless and Conducting Media.	1	30
31	28-12-2017	Conductors & Dielectrics – Characterization	1	31
32	29-12-2017	Wave Propagation in Good Conductors and Good Dielectrics.	1	32
33	30-12-2017	Wave Propagation in Lossless Dielectrics	1	33
34	2-1-2018	Wave Propagation in Lossy Dielectrics	1	34
35	3-1-2018	Polarization.	1	35
36	4-1-2018	Illustrative Problems.	1	36
37	5-1-2018	Add On Topic(Wave Transmission)	1	37
5-1-2018 TO 12-1-2018 REVISION SCHEDULE				
17-1-2018 TO 23-1-2018 I MID EXAMINATIONS				
UNIT – IV EM WAVE CHARACTERISTICS – I				
38	6-1-2018	Reflection and Refraction of Plane Waves – Normal and Oblique Incidences for both Perfect Conductor and Perfect Dielectrics	1	38
39	8-1-2018	<i>(Continued)</i> Reflection and Refraction of Plane Waves – Normal and Oblique Incidences for both Perfect Conductor and Perfect Dielectrics	1	39
40	9-1-2018	<i>(Continued)</i> Reflection and Refraction of Plane Waves – Normal and Oblique Incidences for both Perfect Conductor and Perfect Dielectrics	1	40
41	10-1-2018	<i>(Continued)</i> Reflection and Refraction of Plane Waves – Normal and Oblique Incidences for both Perfect Conductor and Perfect Dielectrics	1	41
42	11-1-2018	Brewster Angle	1	42
43	24-1-2018	Critical Angle and Total Internal Reflection,	1	43
44	25-1-2018	Surface Impedance.	1	44
45	27-1-2018	Poynting Vector and Poynting Theorem – Applications	1	45
46	29-1-2018	Power Loss in a Plane Conductor.	1	46
47	30-1-2018	Problems	1	47
48	31-1-2018	<i>Problems</i>	1	48
49	1-2-2018	Add On Topic(Signal Reception)	1	49
UNIT – V TRANSMISSION LINES – I				
50	2-2-2018	Types, Parameters.		50
51	3-2-2018	Transmission Line Equations		51
52	5-2-2017	Primary & Secondary Constants		52
53	6-2-2018	Expressions for Characteristic Impedance, Propagation Constant,		53
54	7-2-2018	Phase and Group Velocities		54
55	8-2-2018	Infinite Line Concepts, Losslessness /Low Loss Characterization		55
56	9-2-2018	Distortion – Condition for Distortionlessness and Minimum Attenuation	1	56
57	12-2-2018	Loading - Types of Loading.	1	57



58	14-2-2018	Illustrative Problems	1	58
59	15-2-2018	Add On Topic(Propagation System)	1	59
UNIT – VI TRANSMISSION LINES – II				
60	16-2-2018	Input Impedance Relations	1	60
61	17-2-2018	SC and OC Lines	1	61
62	19-2-2018	Reflection Coefficient, VSWR.	1	62
63	20-2-2018	UHF Lines as Circuit Elements; $\lambda/4$, $\lambda/2$, $\lambda/8$ Lines – Impedance Transformations.	1	63
64	21-2-2018	Smith Chart – Configuration and Applications	1	64
65	22-2-2018	Single Stub Matching.	1	65
66	23-2-2018	Double Stub Matching.	1	66
67	24-2-2018	Illustrative Problems	1	67
68	26-2-2018	Add On Topic(Wave Guides)	1	68
27-2-2018 to 18-3-2018 Revision Schedule				
19-3-2018 to 24-3-2018 II Mid Examinations				

Signature of the Faculty

HOD

Principal

COURSE OBJECTIVES & OUTCOMES:

Objectives:

- a. To introduce the student to the fundamental theory and concepts of Electromagnetic waves and transmission lines, and their practical applications.
- b. To study the propagation, reflection, and transmission of plane waves in bounded and unbounded media.

Outcomes:

Upon successful completion of the course, students will be able to

- a. Study time varying Maxwell's equations and their applications in electromagnetic problems.
- b. Determine the relation between time varying electric and magnetic field and electromotive force.
- c. Analyze basic transmission line parameters in phasor domain.
- d. Use Maxwell's equations to describe the propagation of electromagnetic waves in free space.
- e. Show how waves propagate in dielectrics and lossy media.
- f. Demonstrate the reflection and refraction at boundaries.