ChristuJyothi Institute of Technology & Science

Colombonagar, Yeshwanthapur, Jangaon

Department of Electronics and Communication Engineering

Program Name:	B.Tech in ECE	AY	2022-23
Course Name:	EC402PC:ELECTRO MAGNETICFIELDS AND WAVES	Class / Sem	II/II
Faculty Name:	Dr. SREEJA MOLE S S	Regulation	R18

Lesson Plan

Lecturer No.	Topic to be covered	Teaching Aid(TA)/ Methodology (TM)	Text/Reference	Web Reference
1	UNIT – I **Electrostatics:** Coulomb's Law	BB	T1,T2	
2	Coulomb's Law, Electric Field Intensity – Fields due to DifferentCharge Distributions	BB	T1,T2	
3	Electric Flux Density, Gauss Law and Applications	BB, PPT	T1,T2	https://www.slideshare.net/drpmills/electric-fields-3484067
4	Electric Potential, Relations Between E and V	BB	T1,T2	
5	Maxwell's Two Equations for Electrostatic Fields	BB, PPT	T1,T2	
6	Energy Density. Convection and Conduction Currents	BB	T1,T2	
7	Dielectric Constant, Isotropic and Homogeneous Dielectrics	BB,RC	T1,T2	
8	Continuity Equation, Relaxation Time, Poisson's and Laplace's Equations	BB	T1,T2	
9	Capacitance in Series and Parallel	BB	T1	Gap Analysis(Not included in the Syllabus)
10	Capacitance – Parallel Plate, Coaxial, Spherical Capacitors.	BB,PPT	T1,T2	
11	Sliptest-1	BB	T1,T2	
	UNIT – II **Magnetostatics:**			
12	Biot-Savart's Law, Ampere's Circuital Law and Applications	BB	T1,T2	
13	Magnetic Flux Density	BB,PPT	T1,T2	https://www.tcd.ie/Physics/research/groups/magnetism/files/lectures/5006/5006-2.pdf
14	Maxwell's Two Equations for Magnetostatic Fields	BB	T1,T2	
15	Magnetic field intensity for a straight line conductor	BB	T1,T2	Gap Analysis(Not

				included in the Syllabus)
16	Forces dueto Magnetic Fields, Ampere's Force Law.	BB, Tutorial Class	T1,T2	
17	Slip Test-II	BB	T1,T2	
	UNIT – III **Maxwell's Equations (Time Varying Fields):**			
18	Faraday's Law and Transformer EMF	BB	T1 ,T2	
19	Inconsistency ofAmpere's Law and Displacement Current Density	BB	T1,T2	
20	Maxwell's Equations in Different Forms,	BB	T1,T2	
21	Conditionsat a Boundary Surface	BB	T1,T2	
22	Dielectric-Dielectric and Dielectric-Conductor Interfaces.	BB	T1,T2	
23	Induction EMF	BB	T1	Gap Analysis
24	Slip Test-III	BB	T1,T2	
	UNIT – IV **EMWave Characteristics**:	BB	T1,T2	
25	Wave Equations for Conducting and Perfect Dielectric Media	BB	T1,T2	
26	Uniform Plane Waves – Definitions, Relation between E & H	BB		
27	Sinusoidal Variations, Wave Propagation in Lossless and Conducting Media	BB		
28	Conductors & Dielectrics – Characterization	BB	T1,T2	
29	Wave Propagation in Good Conductors and Good Dielectrics	BB,TC	T1,T2	
30	Polarization.	BB	T1,T2	
31	Reflection and Refraction of Plane Waves – Normal and Oblique Incidences for both Perfect Conductorand Perfect Dielectrics	BB	T1,T2	
32	Brewster Angle, Critical Angle and Total Internal Reflection	BB	T1,T2	
33	Surface Impedance, Poynting Vector and Poynting Theorem.	BB	T1,T2	
34	Sliptest-IV	BB	T1,T2	
35	UNIT – V **Waveguides:**	BB		
36	Electromagnetic Spectrum and Bands.			
37	Rectangular Waveguides – Solution of Wave Equations in Rectangular Coordinates	BB	T1,T2	

38	TE/TM mode analysis, Expressions for Fields,	BB	T1,T2	
39	Expressions for Fields, Characteristic Equation and Cut-off Frequencies	BB	T1,T2	
40	Dominant and Degenerate Modes Modes,	BB	T1,T2	
41	Sketches of TE and TM mode fields in the cross-section,	BB	T1,T2	
42	Phase and Group Velocities, Wavelengths and Impedance Relations,	BB	T1,T2	
43	Slip Test-V	BB	T1,T2	

TEXT BOOKS:

1. Engineering Electromagnetics – William H. Hayt Jr. and John A. Buck, 8th Ed., McGrawHill,2014
2. Principles of Electromagnetics – Matthew N.O. sadiku and S.V. Kulkarni, 6th Ed., OxfordUniversity Press, Aisan Edition, 2015.

REFERENCE BOOKS:

1. Electromagnetic Waves and Radiating Systems – E.C. Jordan and K.G. Balmain, 2nd Ed., 2000,PHI.
2. Engineering Electromagnetics – Nathan Ida, 2nd E., 2005, Springer (India) Pvt. Ltd., New Delhi.

Faculty Signature

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