

# GOPAL KRISHNA COLLEGE OF ENGINEERING AND TECHNOLOGY

**GOURAHARI VIHAR, PO: RANIPUT, JEYPORE – 764 005**

## **LESSON PLAN**

**Name of the Subject:** ELECTROMAGNETIC THEORY

**Name of the Faculty:** Subrat Prasad Rath

**Semester:** 4<sup>th</sup> Semester

**Branch:** ETC

**Semester From:**

**No. of Weeks:** 15 Weeks

Week	Day	Theory/ Practical Topics	Classes
		<b>Unit 1 - Coordinate systems &amp; Transformation</b>	<b>6</b>
1	1.	Cartesian	1
	2.	Cylindrical and Spherical Coordinate Systems	1
	3.	Differential length, Area & volume, Line	1
	4.	Surface and Volume Integrals, Del operator, Gradient of a scalar	1
2	5.	Divergence of a vector & divergence theorem	1
	6.	curl of a vector & Stoke's theorem, laplacian of a scalar, Maxwell's equations	1
	7.	<b>Unit 2- Electrostatic Fields, Electrostatic Boundary</b>	<b>8</b>
	8.	Coulomb's Law, Electric Field Intensity	1
	9.	Electric Fields duetopoint, line, surface and volume charge	1
3	10.	Electric Flux Density, Gauss's Law–Maxwell's Equation	1
	11.	Applications of Gauss's Law, Electric Potential, Relationship between E and V–Maxwell's Equation	1
	12.	An Electric Dipole & Flux Lines, Energy Density in Electrostatic Fields	1
	13.	Value Problems: Possion's & Laplace's Equations, Uniqueness theorem	1
4	14.	General procedures for solving position's or Laplace's Equation, Greens functions	1
	15.	<b>Unit 3- Magnetostatic Fields</b>	<b>6</b>
	16.	Magnetic Field Intensity, Biot-Savart's Law	1
	17.	Ampere's circuit law-Maxwell Equation	1
	18.	Applications of Ampere's law	1
5	19.	Magnetic Flux Density-Maxwell's equations	1
	20.	Maxwell's equation for static fields	1
	21.	Magnetic Scalar and Vector potentials. Polarizations of waves	1
	22.	<b>Unit 4- Electromagnetic Fields and Wave Propagation</b>	<b>6</b>
6	23.	Faraday's Law, Transformer & Motional Electromagnetic Forces	1
	24.	Displacement Current, Maxwell's Equation in Final forms	1
	25.	Time Varying Potentials, Time-Harmonic Field. Electromagnetic Wave Propagation	1

	26.	Wave Propagation in lossy Dielectrics	1
7	27.	Plane Waves in loss less Dielectrics	1
	28.	Power & pointing vector	1
	29.	<b>Unit 5- Types of Two-Conductor Transmission Lines</b>	<b>4</b>
	30.	Circuit Model of a Uniform Two-Conductor Transmission Line	1
	31.	The Uniform Ideal Transmission Line	1
8	32.	Wave Reflection at a Discontinuity in an Ideal Transmission Line	1
	33.	Matching of Transmission Lines with Load	1
	34.		1
	35.		1

### Books Recommended:

1. Principles of Electromagnetics, Mathew N.O. Sadiku & S.V. Kulkarni., Oxford University Press, 6th edition
2. Electromagnetic Waves and Radiating Systems, E.C. Jordan and K.G. Balmain, Pearson Education, New Delhi, 2nd Edition
3. C.R.Paul, K.W.White, S.A.Nasor, Introduction to Electromagnetic Fields, 3rd, TMH
4. W.H.Hyat, Electromagnetic Field Theory, 7thEd, TMH.
5. Roger F. Harrington, Time-harmonic electromagnetic fields, McGraw-Hill
6. Principles of Electromagnetic, S.C. Mahapatra, & S. Mahapatra, McGraw Hill Education (India) Pvt. Ltd., New Delhi, 2nd Edition.