



**VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
(AUTONOMOUS)
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**



LESSON PLAN

SUBJECT CODE & NAME : U14EE302& Electromagnetic Field

YEAR / SEMESTER : II EEE A&B / III

Session No.	Topics to be Covered	Duration in minutes	Teaching Aid	Ref.Book
UNIT-I INTRODUCTION				
1	Introduction to Scalar and Vector fields	45	Black Board, You Tube	R-01, R-02
2	Scalar and Vector fields -cotn..	45	Black Board, NPTEL videos	R-01, R-02
3	Different co-ordinate systems	45	Black Board	R-01, R-02
4	Different co-ordinate systems-cotn..	45	Black Board, PPT	R-01, R-02
5	vector calculus	45	Black Board	R-01, R-02
6	vector calculus-cotn	45	Black Board, You Tube	R-01, R-02
7	vector calculus-problems	45	Black Board	R-01, R-02
8	Gradient	45	Black Board, NPTEL videos	R-02
9	Gradient-problems	45	Black Board, NPTEL videos	R-02
10	Divergence	45	Black Board, NPTEL videos	R-02
11	Curl	45	Black Board, You Tube	R-02
12	Revision	45	BB	
UNIT-II ELECTROSTATICS				
1	Coulomb's Law and concept of Electric Field		Black Board, You Tube	R-03
2	Divergence Theorem	45	Black Board, PPT	R-03
3	Gauu's Law	45	Black Board, You Tube	R-03
4	Concept of Electrostatic Potential	45	Black Board, You Tube	R-03
5	Poisson's Equation	45	Black Board	R-03
6	Poisson's Equation-cotn	45	Black Board	R-03
7	Energy in the Field, Capacitance	45	Black Board, NPTEL videos	R-03
8	Capacitance of common two-plate capacitors, including two-wire capacitors	45	Black Board, NPTEL videos	R-03
9	Dielectrics, dielectric boundary conditions	45	Black Board, NPTEL videos	R-03

10	Solution of Laplace's Equation and Poisson's Equation in 1-D	45	Black Board	R-03
11	Capacitance calculations with multiple dielectrics	45	Black Board	R-03
12	Revision	45	BB	
UNIT – III MAGNETOSTATICS				
1	Introduction to Force due to a Magnetic field	45	Black Board, You Tube	R-02
2	Introduction-cotn..	45	Black Board	R-02
3	Force calculation of Magnetic Field for simple coil configurations	45	Black Board, NPTEL videos	R-02
4	Ampere's Law -Magnetic flux	45	Black Board, NPTEL videos	R-02
5	Stokes theorem	45	Black Board	R-02
6	Magnetic materials	45	Black Board	R-02
7	Magnetic boundary conditions	45	Black Board, NPTEL videos	R-02
8	Tutorial-I	45	Black Board, NPTEL videos	R-02
9	Inductance calculations	45	Black Board, PPT	R-02
10	Tutorial-II	45	Black Board	R-02
11	Force on a dipole	45	Black Board, NPTEL videos	R-02
12	Revision	45	BB	
UNIT – IV ELECTRODYNAMIC FIELDS				
1	Emf, electromagnetic induction	45	Black Board, You Tube	R-02
2	Faraday's law for a circuit	45	Black Board, NPTEL videos	R-02
3	Tutorial-I	45	Black Board, NPTEL videos	R-02
4	Interpretation of Faraday's emf;	45	Black Board, You Tube	R-02
5	Tutorial-II	45	Black Board, You Tube	R-02
6	Self-inductance , inductance of long solenoid,	45	Black Board, PPT	R-02
7	Coaxial cylinders,	45	Black Board	R-02
8	Parallel cylinders	45	Black Board, NPTEL videos	R-02
9	Mutual inductance	45	Black Board	R-02
10	Transformers; magnetic energy density	45	Black Board, NPTEL videos	R-02
11	Tutorial-III	45	Black Board	R-02
12	Revision	45	BB	
UNIT – V ELECTROMAGNETIC WAVES				

Law,

1	The Displacement current	45	Black Board, You Tube	R-02, R-03
2	Maxwell's Equation	45	Black Board, PPT	R-02, R-03
3	The wave equation in 1-Dimension	45	Black Board	R-02, R-03
4	Solution of the wave equation.	45	Black Board, NPTEL videos	R-02, R-03
5	Tutorial-I	45	Black Board	
6	Plane waves -Wave propagation in vacuum and lossy dielectrics	45	Black Board, NPTEL videos	R-02, R-03
7	Tutorial-II	45	Black Board	
8	Skin depth and frequency dependence of lumped elements	45	Black Board	R-02, R-03
9	Energy transport by waves-The Poynting vector	45	Black Board	R-02, R-03
10	Reflection at boundaries. Normal incidence formula. Impedence matching.	45	Black Board, NPTEL videos	R-02, R-03
11	Tutorial-III	45	Black Board	R-02, R-03
12	Revision	45	BB	R-02, R-03

REFERENCES:

1.	Mathew N. O. SADIKU, 'Elements of Electromagnetics', Oxford University press Inc. First India edition, 2007.
2.	J. R. Reitz, F. J. Milford and R. W. Christie, "Foundations of Electromagnetic Theory", Addison Wesley (2008).
3.	Plonsey, R. and Collin, R.E., Principles and Applications of Electromagnetic Fields - McGraw Hill. 1961.