PVP23

EMI /EMC

Course Code	23EC6501	Year	III	Semester	I
Course Category	Honors	Branch	ECE	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	EM Theory Communications
Continuous Internal Evaluation:	30	Semester End Evaluation:	70	Total Marks :	100

Course Outcomes		BL
Upon successful completion of the course, the student will be able to		
CO1	Familiarize with the fundamentals in the field of EMI / EMC	L2
CO2	Analyze various EMI sources and measurements)	L4
CO3	Apply various techniques for EM radiation measurements	L3
CO4	Apply various Conducted Interference measurement for EM radiation	L3

Mapping of course outcomes with Program outcomes (CO/ PO/PSO Matrix)

Note: 1- Weak correlation 2-Medium correlation 3-Strong correlation

* - Average value indicates course correlation strength with mapped PO

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO 9	PO 10	PO 11	PSO1	PSO2
CO1	2						2				2		2
CO2		3									2		2
CO3	2												2
CO4	2												
Average* (Rounded to nearest integer)	**2**	**3**					**2**				**2**		**2**

Syllabus		
Unit No.	**Contents**	**Mapped CO**
1	**Introduction**: History and concept of EMI, Definitions of EMI/EMC, Electromagnetic environment, Practical experiences and concerns, frequency spectrum conservation, mechanisms of EMI generation, EMI testing, Methods of elimination of EMI and Biological effects of EMI	CO1, CO2
2	**Natural and manmade sources of EMI/EMC**: Sources of Electromagnetic noise, typical noise paths, modes of noise coupling, designing for EM compatibility, lightening discharge, electro static discharge (ESD), electromagnetic pulse (EMP).	CO1, CO2
3	**EMI from Apparatus / Circuits and open area test sides:** Electromagnetic emissions, noise form relays and switches, non-linearities in circuits, passive inter modulation, transients in power supply lines, EMI from power electronic equipment, EMI as combination of radiation and conduction. Open area test sides: OATS measurements, measurement precautions.	CO1, CO3

4	**Radiated Interference Measurements:** anechoic chamber, TEM cell, reverberating chamber, GTEM cell, comparison of test facilities.	CO1, CO3
5	**Conducted Interference Measurement**: Characterization of conduction currents / voltages, conducted EM noise and power line, conducted EMI from equipment, immunity to conducted EMI, characteristics of EMI filters and power line filter design.	CO1, CO3, CO4

Learning Resources
Text Books
1. V.P. Kodali, Engineering Electromagnetic Compatibility, 2nd Ed., IEEE Press, 2001 2. Clayton R Paul, Introduction to Electromagnetic Compatibility, 3rd Ed., John Wiley Sons, 2023
Reference Books
1. Electromagnetic Interference and Compatibility IMPACT series, IIT Delhi
e- Resources
1. https://en.wikipedia.org/wiki/Electromagneticompatibility 2. https://www.element.com/nucleus/2017/whats-the-difference-emc-vs-emi