PVP 19

EMI and EMC TECHNIQUES

Course Code	19EC4801D	**Year**	IV	**Semester**	II
Course Category	Programme Elective-VI	**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	
Upon successful completion of the course, the student will be able to	
CO1	Understand and Gain basic knowledge of problems associated with EMI and EMC from electronic circuits and systems
CO2	Analyze various sources of EMI and various possibilities to provide EMC
CO3	Analyze possible EMI prevention techniques such as grounding, shielding, filtering and use of proper coupling mechanisms to improve compatibility of electronic circuits and systems in a given electromagnetic environment.
CO4	Measure emission immunity level from different systems to couple with the prescribed EMC standards

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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	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3												2
CO2	3	3	3	3	3	2						1		2
CO3	3	3	3	3	3	2						1		2
CO4	3	3	3	3	3	2						1		2
Average* (Rounded to nearest integer)	3	3	3	3	3	2						1		2

Syllabus		
Unit No.	**Contents**	**Mapped CO**
I	**Introduction**: Electromagnetic environment, history, concepts, practical experience and concerns, frequency spectrum conservations, an over-view of EMI/EMC, Overview on natural and nuclear sources of EMI.	CO1, CO2
II	**EMI from Apparatus and circuits :** Electromagnetic emissions, noise from relays and switches, non-linearities in circuits, passive inter-modulation, cross-talk in transmission lines, transients in power supply lines, electromagnetic interference(EMI), Overview on Open area test sites and measurements	CO1, CO2

III	**Radiated and Conducted Interference Measurements :** Anechoic chamber, TEM cell, GH TEM cell, characterization of conduction Currents/voltages, conducted EM noise on power lines, conducted EMI from Equipment, immunity to conducted EMI detectors and measurements.	CO1, CO3
IV	**Grounding, Shielding and Bonding:** Principles and Types of grounding, shielding and bonding,	CO1, CO3
V	**Cables, Connectors and Components:** EMI suppression cables, EMC connectors, EMC gaskets, isolation transformers, opt isolators.	CO1, CO2, CO4

Learning Resources
Text Books
1.V.P.Kodali, Engineering Electromagnetic Compatibility,2/e, IEEE Press,2000
Reference Books
1.Clayton R Paul, Introduction to Electromagnetic Compatibility, John Wiley and Sons,2010 2. Electromagnetic Interference and Compatibility IMPACT series, IIT Delhi (Units1- 9)
E - Resources: 1. https://emcfastpass.com/emc-testing-beginners-guide/emc-books-resources-training/ 2. https://interferencetechnology.com/emc-resources/