GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. Semester: III

Power Electronics

Subject Name: **EMC in Power Electronics (Major Elective-IV)**
Subject Code: **732903**

Sr No.	Course Content
1	**Introduction:** History of EMC Standardization Efforts, Description of electromagnetic disturbances, Classifying Disturbances by Frequency Content, Classifying Disturbances by Character, Classifying Disturbances by Transmission mode.
2	**EMI Measurement:** EMI Measuring Instruments, Basic Terms and Conducted EMI References, Measuring the Interference Voltage, Measuring the Interference Current, Spectrum Analyzers, EMI Measurements for Consumer Appliances, Measuring Impulse-Like EMI.
3	**EMI in Power Electronic Equipment:** EMI from Power Semiconductors, EMI from Controlled Rectifier Circuits, EMI Calculation for Semiconductor Equipment, EMI Filter Elements, Measuring HF Characteristics of EMI Filter Elements,
4	Noise Suppression, Noise Suppression in Relay Systems, Application of AC Switching Relays, Application of RC-Snubbers to Power Semiconductors, Shielded Transformers, Capacitor Filters, EMI Generation and Reduction at Its Source, Influence of Layout and Control of Parasitics.
5	EMI Filter Circuit: Selection and Measurement, Definition of EMI Filter Parameters, EMI Filter Circuits, Insertion Loss Test Methods, EMI Filter Design, EMI Filter Design for Insertion Loss, Calculation of Worst-Case Insertion Loss, Design Method for Mismatched Impedance Condition, Design Method for EMI Filters with Common-Mode Choke Coils, Damped EMI Filters and Lossy Filter Elements, HF Characteristics of Noise Filter Circuit Elements
6	Testing for Susceptibility to Power Line Disturbances, Surge Voltages in AC Power Mains, EMC Tests per IEC Specifications, Other EMS Test Methods, Reduction Techniques for Internal EMI, Conductive Noise Coupling, Electromagnetic Coupling, Electromagnetic Coupling Reduction Methods, Wiring Layout Methods to Reduce EMI Coupling PCB Design Considerations.
7	Transient Susceptibility Analysis Method, Noise Filter Design Method for Voltage Attenuation, Calculating the Energy Content of Transient Disturbances, Impulse Characteristics and Noise Filter Design, Surge Protection Devices.

Reference Books:

1. EMC in Power Electronics, L. Tihanyi, IEEE PRESS.
2. Power electronics Handbook, M. H. Rashid, PHI.
3. Power electronics Handbook, Mazda, Newnespress.
4. EMI/EMC computational modeling handbook, Bruce Archambeault, Colin Brench, Omar M. Ramahi , Kluwer press.
5. Research Papers on EMI, EMC etc…
6. A Handbook for EMC Testing and Measurement, D. Morgan.
7. EMC for product designers , Tim Williams – Newnespress.