EC-311B	EMC / EMI (ELECTIVE - I)	L T P C 4 - - 3

COURSE OBJECTIVES:

1. To provide information on various types EMI sources.
2. To study EMI on various test sites.
3. To study about various equipment to measure EMIâ€•.
4. To study various types techniques for suppressing noise.
5. To study different standards of EMC designs.

COURSE OUTCOMES:

After successful completion of the course, the students are able to

1. â€œunderstand switching methods and signalling techniques in telecommunication systems.
2. analyze traffic and grade of service parameters in telecommunication networks.
3. demonstrate hardware and protocols used in data communication.
4. understand T1 carrier , T carrier systems, Digital hierarchies followed in North America and Europe and FDM hierarchy.
5. understand componets, protocols, features and services in ISDN, home networking and network convergence.

UNIT I *Text Book - 1* **(10)**

Introduction, Natural and Nuclear sources of EMI / EMC : Electromagnetic environment, History, Concepts, Practical experiences and concerns, frequency spectrum conservations. An overview of EMI / EMC, Natural and Nuclear sources of EMI.

UNIT II *Text Book - 1* **(12)**

EMI from apparatus, circuits and open area test sites : Electromagnetic emissions, noise from relays and switches, non-linearities in circuits, passive intermodulation, cross talk in transmission lines, transients in power supply lines, electromagnetic interference (EMI). Open area test sites and measurements.

UNIT III *Text Book - 1,2* **(10)**

Radiated and conducted interference measurements and ESD : 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. ESD, Electrical fast transients / bursts, electrical surges.

UNIT IV *Text Book - 1* **(12)**

Grounding, shielding, bonding and EMI filters : Principles and types of grounding, shielding and bonding, characterization of filters, power lines filter design.

UNIT V *Text Book - 1,2* **(10)**

Cables, connectors, components and EMC standards : EMI suppression cables, EMC connectors, EMC gaskets, Isolation transformers, optoisolators, National / International EMC standards.

LEARNING RESOURCES:

TEXT BOOK(s):

1. Dr. V.P.Kodali - Engineering Electromagnetic Compatibility by IEEE Publication, Printed in India by S.Chand & Co. Ltd., New Delhi, 2000.

2. Electromagnetic Interference and Compatibility IMPACT series, IIT - Delhi, Modules 1-9.

REFERENCE BOOK(s):

C.R. Pal - Introduction to Electromagnetic Compatibility, John Wiley, 1992.

WEB RESOURCES:

1. www.measurement-testing.com/EMC-electromagnetic-compatibility
2. www.thefreedictionary.com/Electromagnetic+interference
3. wikipedia.org/wiki/Conducted_Electromagnetic_Interference