

PEI304: CIRCUIT DESIGNING AND TESTING

L	T	P	Cr
2	1	2	3.5

Course Objectives: To understand the concepts of circuit design, to enable design and validate analogue circuits

Circuit design: Designing circuits with transistors, MOSFETS and OPAMPs (amplification and filtering), Design guidelines for signal conditioning circuits for sensor inputs, Component selection and BOM preparation.

Design tools: Introduction and review of various EDA tools. Orcad16 or above Software (Cadence) for Schematic creations, validation and simulation using SIMULINK. Introduction to PCB Layout design tools.

Compliance test standards for IEC and CISPER. Design guidelines for meeting the compliance requirement of the standards.

Reliability prediction tools for the designs.

Design validation: Design validation as per IEC test standards and accelerated life testing methodologies and design guidelines., EMI EMC practices and testing as per IEC standards. Design guidelines for EMC.

Laboratory Work: Circuit Designing, testing , PCB layout and Simulation using OrCAD, Simulink, Design validation as per IEC standards of various components.

Minor Project: Nil

Course learning outcome (CLO): After the completion of the course the students will be able to

1. Design analog circuits

Use EDA tools

Meet with the compliance requirements

Use reliability prediction tools

Validate the design

Recommended Books:

1. Kraig Mitzner , “Complete PCB Design Using OrCad Capture and Layout”, Newnes 2007.
2. Tim Williams, *The Circuit Designer's Companion, Second Edition (EDN Series for Design Engineers)*, Newnes 2007.
3. Parag K. Lala, “Digital circuit testing and testability”, Academic Press, 1997.

Evaluation Scheme:

S.No	Evaluation Elements	Weightage (%)
1.	MST	20
	EST	40
	Sessionals (May include Assignments/ Projects/ Tutorials/ Quizes/ Lab Evaluations)	40