POWER ELECTRONICS (LAB) EE-421L

Pre-requisite: Electronic Circuit Design-II
Credit Hours 01
Contact Hours 48

RECOMMENDED BOOKS

Power Electronics Lab Manual

REFERENCE BOOKS

- Power Electronic Circuits and Devices by H.M. Rashid
- Fundamental of Power Electronics by Robert Ericson
- Power Electronic "A first course" by Ned Mohan
- Power Electronics: Converters, Applications, and Design by Ned Mohan

OBJECTIVES OF LAB COURSE

The objective of this lab is to study the characteristics of different power electronic devices (Power Diode, MOSFET, and IGBT) and converters based on these power devices. This course provides the basic knowledge about four types of converters including AC- DC, DC-DC, DC-AC and AC-AC converters. Further, FFT analysis of power converters is also done using software tools (MATLAB/Simulink).

S.NO	CLO/PLOS MAPPING	DOMAIN	PLO
01	Analyze different power converter circuits using mathematical knowledge.	**P3**	**02**
02	Demonstrate the characteristics of different power devices and working of different power converters using software and hardware.	**P1**	**03**
03	Justify concepts related to Power Electronics Lab.	**P4**	**10**

COURSE CONTENTS

1. Introduction to MATLAB/Simulink for Power Converters
2. Switching Characteristics of Thyristor
3. Switching Characteristics of Power MOSFET
4. Switching Characteristics of Power IGBT
5. Uncontrolled Half and Full Wave Rectifiers
6. Controlled Rectifiers
7. First Quadrant Chopper
8. Four Quadrant Chopper
9. Buck Converter
10. Boost Converter
11. Single Phase Full Bridge Inverter
12. FFT Analysis of Power Converters using MATLAB/Simulink