



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(An Autonomous Institution Since 2010)

Approved by AICTE, New Delhi and Permanently Affiliated to JNTUK, Kakinada  
Accredited by NAAC with Grade 'A' & ISO: 21001:2018, 50001:2018, 14001:2015 certified

Department of Electrical and Electronics Engineering

Accredited by NBA under Tier-I

## POWER ELECTRONICS & DRIVES LAB

### DESCRIPTION OF LAB

Power Electronics is an important area of Electrical Engineering. It broadly deals with controlling the flow of electrical power using electronic switching devices. Power Electronics lab introduces the student to measurement and simulation of important operating characteristics of power electronic circuits and power semiconductor devices.



### MAJOR EQUIPMENT AVAILABLE IN LAB:

3-Phase Fully Controlled Bridge Converter
•Four Quadrant Chopper Drive
•3- Phase A.C Voltage Controller For 1HP Induction Motor Drive
•Single phase IGBT based PWM Inverter
•MOSFET based Buck-Boost Converter
•DSP Based Control of 1HP
3-Phase Induction Motor Drive (V/F Control)
•FPGA Based Control of BLDC Motor Drive
•3-Phase Multi Level Inverter Power Module
•FPGA Based DC-DC Buck converter

## LIST OF EXPERIMENTS

### **B.Tech.(VI Sem) 20EE60- POWER ELECTRONICS AND DRIVES LAB**

1. Characteristics of SCR, IGBT & Power MOSFET.
2. Single phase AC voltage controller with R & RL Loads.
3. Single phase IGBT inverter with R and R-L Loads.
4. Single phase Cyclo converter with RL load.
5. Three phase fully controlled bridge converter fed dc motor drive.
6. Four quadrant operation of chopper fed dc drive.
7. Three phase Ac Voltage controller fed Induction motor drive.
8. Three phase slip ring Induction motor by Static Rotor Resistance Control.
9. Single phase fully controlled rectifier with R & RL loads using simulation tools.
10. Single phase inverter with PWM technique using simulation tools

### **M.Tech. (I Sem.) 23PE61-Power Converters and Drives-I**

## **LIST OF EXPERIMENTS**

<b>Hardware based:</b>
<b>1. Switching characteristics of power diode, BJT, MOSFET, IGBT and SCR using bread board</b>
<b>2. Determination of output voltage and characteristics of 1-phase dual converter with RL load</b>
<b>3. Determination of output voltage and frequency of 1-phase step down cyclo converter with R &amp; RLloads for different firing angles</b>
<b>4. Output voltage characteristics of 3-phase IGBT based PWM Inverter on R &amp; R-L loads for different modulation indices</b>
<b>5. Output voltage characteristics of diode clamped multi- level inverter with R &amp; RL loads</b>
<b>6. Speed control of three phase converter-controlled dc motor drive</b>
<b>7. Study and analyze the performance of four quadrant operation of chopper fed dc motor drive at different firing angles</b>

<b>8. Determination of speed and output voltage of 3-phase A.C. Voltage controller fed induction motor drive</b>
<b>9. Starting and Running characteristics of capacitor start &amp; capacitor run single phase Induction Motor</b>
<b>10. Output voltage characteristics of flying capacitors multi- level inverter- fed induction motor drive</b>
<b>Additional Experiments</b>
11. Speed control of a three- phase slip ring Induction motor by Static Rotor Resistance Control.
12. Speed control of a three- phase induction motor drive using vector control method.

**M.Tech. (II Sem.) 23PE63-Power Converters and Drives-II Lab**

**LIST OF EXPERIMENTS**

**Hardware based:**

1. DC output voltage & AC link voltage characteristics of isolated dc-dc resonant converter
2. Output voltage characteristics of dc-dc buck converter with R & RL loads using FPGA controller
3. Power factor correction of PIC Microcontroller based boost converter
4. Output voltage and current characteristics of dc-dc buck boost converter with R & RL loads
5. Output voltage and current characteristics of dc-dc forward converter with R & RL loads
6. Speed control of PM synchronous motor by voltage control method
7. Speed control of BLDC motor by voltage control method
8. Speed control of Switched Reluctance Motor with eddy current loads
9. Speed control of 3 phase Induction motor with DSP based V/f technique
10. Digital to Analog converter (DAC) and Analog to Digital converter (ADC) using digital controller

**Additional Experiments**

11. Generation of sinusoidal signal using digital controller
12. Generation of three phase sine triangle PWM pulses using digital controller.

LAB INCHARGE :Mr. P. Deepak Reddy

LAB TECHNICIANMr. P. Nagireddy