EE3511 **POWER ELECTRONICS LABORATORY** **L T P C**
0 0 3 1.5

COURSE OBJECTIVES:

- To study the VI characteristics of SCR, TRIAC, MOSFET and IGBT.
- To analyze the performance of semi converter, full converter, step up, step down choppers by simulation and experimentation.
- To study the behavior of voltage waveforms of PWM inverter applying various modulation techniques.
- To design and analyze the performance of SMPS.
- To study the performance of AC voltage controller by simulation and Experimentation.

LIST OF EXPERIMENTS:

1. Characteristics of SCR and TRIAC.
2. Characteristics of MOSFET and IGBT.
3. AC to DC half controlled converter.
4. AC to DC fully controlled converter.
5. Step down and step up MOSFET based choppers.
6. IGBT based single phase PWM inverter.
7. IGBT based three phase PWM inverter.
8. AC Voltage controller.
9. Switched mode power converter.
10. Simulation of PE circuits (1Φ & 3Φ semi converter, 1Φ & 3Φ full converter, dc-dc converters, ac voltage controllers).

TOTAL :45 PERIODS

COURSE OUTCOMES:

Upon the successful completion of the course, students will be able to:

CO1: Determine the characteristics of SCR, IGBT, TRIAC, MOSFET and IGBT

CO2: Find the transfer characteristics of full converter, semi converter, step up and step down choppers by simulation experimentation.

CO3: Analyze the voltage waveforms for PWM inverter using various modulation techniques.

CO4: Design and experimentally verify the performance of basic DC/DC converter topologies used for SMPS.

CO5: Understand the performance of AC voltage controllers by simulation and experimentation

MAPPING OF COs WITH POs AND PSOs

COs	POs												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	3	-	-	1.5	-	-	-	3	3	3	3
CO2	3	3	3	3	3	-	-	1.5	-	-	-	3	3	3	3
CO3	3	3	3	3	3	-	-	1.5	-	-	-	3	3	3	3
CO4	3	3	3	3	3	-	-	1.5	-	-	-	3	3	3	3
CO5	3	3	3	3	3	-	-	1.5	-	-	-	3	3	3	3
Avg	3	3	3	3	3	-	-	1.5	-	-	-	3	3	3	3

Faculty of Electrical Engineering

B.E. Electrical and Electronics Engineering

(R 2021) Semester – V

MAJOR EQUIPMENT

Course Code: EE3511

Course Title: POWER ELECTRONICS LABORATORY

Subject In charge: L.Suganya

Sl. No.	Description of Equipment	Required numbers (for batch of 30 students)
1	Single phase Semi converter	2 Nos.
2	Single phase Full converter	2 Nos.
3	Step down chopper	1 No.
4	Step up chopper	1 No.
5	Single phase PWM Inverter	2 Nos.
6	Three phase PWM Inverter	2 Nos.
7	Buck converter	1 No.
8	Buck Boost converter	1 No.
9	Boost Converter	1 No.
10	AC Voltage Controller	1 No.
11	Computer	10 Nos.

Faculty of Electrical Engineering

B.E. Electrical and Electronics Engineering

(R 2021) Semester – V

MINOR EQUIPMENT

Course Code: EE3511

Course Title: POWER ELECTRONICS LABORATORY

Sl. No.	Description of Equipment	Required numbers (for batch of 30 students)
1	Bread board	15 Nos.
2	SCR, TRIAC, IGBT, MOSFET	10 Nos. each
3	Voltmeter, Ammeter	10 Nos.
4	Regulated DC power supply	10 Nos.
5	Patchchords	20 Nos.
6	Multimeter	10 Nos.
7	CRO	10 Nos.

Faculty of Electrical Engineering

B.E. Electrical and Electronics Engineering

(R 2021) Semester – V

SAFETY MEASURES

- General Rules of Conduct in Laboratories are displayed.
- Specific Safety Rules for students are displayed.
- Fire Extinguisher and First aid kit are regularly inspected and restocked as necessary.
- All electrical wires are protected by using MCB.
- Well trained technical supporting staff.
- Periodical servicing of the lab equipments.
- Maintaining a clean and organized laboratory.