Department of Electrical & Electronics Engineering

COURSE MODULES OF THE SUBJECT TAUGHT FOR THE ODD SESSION

COURSE SYLLABI WITH CO'S

Faculty Name: **Mrs Sowmyashree K S**				Academic Year: 2024 - 2025			
Department: **Electrical & Electronics Engineering**							

Lab Code	Lab Title	Core/Elective	Prerequisite	Contact Hours			Total Hrs/ Sessions
				L	T	P	
BEEL504	**Power Electronics Laboratory**	**Core**	**Basic Electronics, Analog Electronic Circuits**	-	-	**2**	-

Objectives	• To conduct experiments on semiconductor devices to obtain their static characteristics. • To study different methods of triggering the SCR • To study the performance of single-phase controlled full wave rectifier and AC voltagecontroller with R and RL loads. • To control the speed of a DC motor, universal motor, and stepper motor. • To study single-phase full bridge inverter connected to resistive load.

Experiments Covered as per Syllabus	
1	Static Characteristics of SCR.
2	Static Characteristics of MOSFET and IGBT.
3	Characteristic of TRIAC.
4	SCR turns on a circuit using a synchronized UJT relaxation oscillator.
5	SCR digital triggering circuit for a single-phase controlled rectifier and AC voltage regulator.
6	Single phase controlled full wave rectifier with R and R –L loads.
7	AC voltage controller using TRIAC and DIAC combination connected to R and RL loads.
8	Speed control of DC motor using single semi converter.
9	Speed control of stepper motor.
10	Speed control of universal motor using AC voltage regulator.
11	Speed control of a separately excited D.C. Motor using an IGBT or MOSFET chopper.
12	Single phase MOSFET/IGBT-based PWM inverter.

Revised Bloom's Taxonomy Level:	**L1 – Remembering; L2 – Understanding; L3 Applying; L4 – Analyzing;**

Course outcomes: At the end of the course the students will be able to:

CO.1. Analyze the static characteristics of semiconductor devices and compare their performance.

CO.2. Analyze the different turn-on methods of SCR.

CO.3. Analyze the performance of single-phase controlled full wave rectifiers and AC voltage controllers with R and RL loads.

CO.4. Take part in Speed control of DC motors, universal motors, and stepper motors by using power electronic circuits.

CO.5. Analyze and design the snubber circuit.

List of Text Books

1. "Power Electronics: Circuit Devices and Applications", Mohammad H Rashid, 4th Edition 2014
2. "Power Electronics: Converters, Applications and Design", Ned Mohan, 3rd Edition 2014.

3. "Power Electronics", Daniel W Hart, 1st Edition 2011 4. "Elements of Power Electronics", Philip T Krein, Oxford, Indian Edition, 2008.	

List of URLs, Textbooks, Notes, Multimedia Content, etc

- http://www.ece.rutgers.edu/332_460

- Ned Mohan, et al,. Power Electronics, Wiley Eastern Ltd, 1989.
- Shepherd, et al,. Power Electronics and Motor Control., Cambridge University Press, 1998

Internal Assessment Marks: 50 (Record is evaluated for 30 marks and the test is for 20 marks)

THE CORRELATION OF COURSE OUTCOMES (CO'S) AND PROGRAM OUTCOMES (PO'S)

Course Code:	BEEL504			TITLE: Power Electronics Laboratory									PSO's	
List of Course Outcomes	**Program Outcomes**													
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6** **PO7**		**PO8**	**PO9**	**PO10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**
CO-1	3	-	-	-	-	-	-	-	2	2	-	2	2	1
CO-2	3	2	-	-	-	-	-	-	2	2	-	2	2	1
CO-3	3	-	-	-	-	-	-	-	2	2	-	2	3	2
CO-4	3	-	-	-	-	-	-	-	2	2	-	2	3	2
CO-5	3	2	-	-	-	-	-	-	2	2	-	2	2	2

Note: 3 = Strong Contribution   2 = Average Contribution   1 = Weak Contribution "-" = No Contribution