

NAME OF THE FACULTY : RAVINDER KUMAR

DISCIPLINE : ECE

SEMESTER : IV

SUBJECT : POWER ELECTRONICS

LESSON PLAN DURATION : - 15 weeks (from 15 January- 2026 to 01 May- 2026)

WORK LOAD (LECTURE/PRACTICAL) PER WEEK (IN HOURS):- LECTURE-03, PRACTIACL-04 PER GROUP

WEEK	THEORY		PRACTICAL		
	Lecture / Hrs	TOPIC (Including Assignment/Test)	Practical / Hrs		Experiment
1 st	1	Introduction to Thyristors and other Power Electronics Devices	Group-1	1-4	To plot V-I characteristic of an SCR.
	2	Construction, Working principle of SCR			
	3	Two transistor analogy of SCR, V-I characteristics of SCR.	Group-2	1-4	To plot V-I characteristic of an SCR.
2 nd	4	SCR specifications and ratings, Different methods of SCR triggering	Group-1	1-4	To plot V-I characteristics of TRIAC
	5	Different commutation circuits for SCR, Series and parallel operation of SCR			
	6	Construction and working principle of DIAC.	Group-2	1-4	To plot V-I characteristics of TRIAC
3 rd	7	Construction and working principle of DIAC, TRIAC	Group-1	1-4	To plot V-I characteristics of UJT.
	8	DIAC, TRIAC and their V-I characteristics			
	9	Construction, working principle of UJT, V-I characteristics of UJT. UJT as relaxation oscillator	Group-2	1-4	To plot V-I characteristics of UJT.
4 th	10	Brief introduction to Gate Turn off Thyristor (GTO), Programmable Uni-junction Transistor (PUT), MOSFET	Group-1	1-4	To plot V-I characteristics of DIAC
	11	Basic idea about the selection of Heat Sink for Thyristors			
	12	Applications such as light intensity control, speed control of universal motors, fan regulator, battery charger.	Group-2	1-4	To plot V-I characteristics of DIAC
5 th	13	Assignment-1	Group-1	1-4	Revision Experiment Performed
	14	Sessional Test-1			
	15	Controlled Rectifiers Introduction	Group-2	1-4	Revision Experiment Performed

6 th	16	Single phase half wave controlled rectifier with load (R)	Group-1	1-4	Study of UJT relaxation oscillator. And observe I/P and O/P wave forms
	17	Single phase half wave controlled rectifier with load (R-L)			
	18	Single phase half controlled full wave rectifier with load (R)	Group-2	1-4	Study of UJT relaxation oscillator. And observe I/P and O/P wave forms
7 th	19	Single phase half controlled full wave rectifier with load (R-L)	Group-1	1-4	Observation of wave shape of voltage at relevant point of single-phase half wave controlled
	20	Fully controlled full wave bridge rectifier.			
	21	Single phase full wave centre tap rectifier	Group-2	1-4	Observation of wave shape of voltage at relevant point of single-phase half wave controlled
8 th	22	Inverters, Choppers,	Group-1	1-4	Observation of wave shapes and measurement of voltage at relevant points in TRIAC based.
	23	Dual Converters and Cyclo-converters			
	24	Principle of operation of basic inverter circuits	Group-2	1-4	Observation of wave shapes and measurement of voltage at relevant points in TRIAC based
9 th	25	Concepts of duty cycle, series and parallel	Group-1	1-4	Revision Experiment Performed
	26	Inverters and their applications			
	27	Choppers: Introduction, types of choppers (Class A)	Group-2	1-4	Revision Experiment Performed
10 th	28	Choppers: Introduction, types of choppers (Class B, Class C and Class D)	Group-1	1-4	Revision Experiment Performed
	29	Assignment-2			
	30	Sessional Test-2	Group-2	1-4	Revision Experiment Performed
11 th	31	Step up and Step down choppers	Group-1	1-4	Installation of UPS system and routine maintenance of batteries.
	32	Dual Converters and cyclo converters: Introduction, types and basic working principle of Dual converters and cyclo Converters.			
	33	Dual converters and cyclo converters and their applications	Group-2	1-4	Installation of UPS system and routine maintenance of batteries.

12 th	34	Thyristorised Control of Electric drives: Introduction	Group-1	1-4	Revision Experiment Performed
	35	DC drive control, Half wave drives	Group-2	1-4	Revision Experiment Performed
	36	Full wave drives, Chopper drives (Speed control of DC motor using choppers)			
13 th	37	AC drive control, Phase control	Group-1	1-4	Revision Experiment Performed
	38	Constant V/F operation, Cycloconverter /Inverter drives	Group-2	1-4	Revision Experiment Performed
	39	Un interrupted Power Supply (UPS): Introduction			
14 th	40	UPS: Block Diagram & specifications of on-line	Group-1	1-4	Revision Experiment Performed
	41	UPS: Block Diagram & specifications of Off line UPS	Group-2	1-4	Revision Experiment Performed
	42	UPS: Block Diagram & specifications of Smart UPS			
15 th	43	Concept of high voltage DC transmission	Group-1	1-4	Revision Experiment Performed
	44	Assignment- 3	Group-2	1-4	Revision Experiment Performed
	45	Sessional Test- 3			