Government Polytechnic for Women, Sirsa (Haryana)

NAME OF THE FACULTY: - Dr. Shikha Sukhija
DISCIPLINE: - ECE
SEMESTER:- 4th
SUBJECT—Power Electronics
Lesson Plan Duration:- 15 weeks
Work Load (Lecture/Practical) per week (In hours): Lecture- 03, Practical -04

Week	Theory		Practical	
	Lecture Day	**Topic (Including assignment/test)**	**Practical**	**Topic**
1st	1st	Introduction to thyristors and other Power Electronics Devices		Introduction to all Practicals and safety precautions regarding voltages used in UPS etc.
	2nd	Role of Power electronics		
	3rd	Construction, working principles of SCR, two transistor analogy of SCR, V-I characteristics of SCR		
2nd	4th	SCR specifications & ratings	1st	To plot VI characteristic of an SCR
	5th	$\frac{di}{dt}$ & $\frac{dv}{dt}$ protection of SCR		
	6th	Different methods of SCR triggering		
3rd	7th	Different commutation circuits for SCR	2nd	To plot VI characteristics of TRIAC
	8th	Construction & working principle of DIAC, TRIAC and their V-I characteristics		
	9th	Construction, working principle of UJT, V-I characteristics of UJT. UJT as relaxation oscillator		
4th	10th	Basic idea about the selection of Heat sink for thyristors	Internal viva for the conducted 2 practicals	
	11th	Application such as light intensity control, speed control of universal motors, fan regulator, battery charger		
	12th	Introduction to Controlled Rectifiers		
5th	13th	Single phase half wave controlled rectifier with load (R, R-L)	3rd	To plot VI characteristics of UJT
	14th	Single phase half controlled full wave rectifier (R, R-L)		
	15th	Single phase fully controlled full wave bridge rectifier		
6th	16th	Single phase full wave centre tap rectifier	4th	To plot VI characteristics of DIAC
	17th	Introduction to Inverters, Choppers, Dual Converters and Cyclo converters		
	18th	Principle of operation of basic inverter circuits		
7th	19th	concepts of duty cycle		Problems ,if any in all four practicals to be taken and resolve
	20th	series & parallel, inverters & their applications		
	21	Choppers: Introduction, types of choppers (Class A, Class B, Class C and Class D)		
8th	22	Step up and step down choppers	Internal viva for the conducted 4 practicals	
	23	Dual Converters and cyclo converters		
	24	Introduction, types & basic working principle of dual converters		

9th	25	cyclo converters & their applications	5th	To study UJT relaxation oscillator and observe different wave forms
	26	Introduction to Thyristorised Control of Electric drives		
	27	DC drive control		
10th	28	Half wave drives	6th	To observe wave shapes at relevant points in a circuit of single-phase half wave controlled rectifier and effect of change of firing angle
	29	Full wave drives		
	30	Chopper drives (Speed control of DC motor using choppers)		
11th	31	AC drive control	Internal viva for the conducted 6 practicals	
	32	Phase control		
	33	Constant V/F operation		
12th	34	Cycloconverter/Inverter drives	7th	To observe wave shapes and measurement of voltage at relevant points in TRIAC based AC phase control circuit
	35	Uninterrupted Power supplies	8th	To observe output wave shape in a circuit for single phase full wave controlled rectifier
	36	Introduction to UPS	Internal viva for the conducted 8 practicals	
13th	37	on-line UPS		Problems ,if any in last four practicals to be taken and resolve
	38	off-line UPS	9th	To study installation of UPS system and routine maintenance of batteries
	39	Specifications of UPS	Internal viva for the conducted 9 practicals	
14th	40	Concept of high voltage DC transmission	10th	Visit to any Solar Power Plant
	41	Classification of batteries		Revision of Practicals
	42	Introduction to solar power plants and their components		Problems ,if any in any practical and resolve
15th	43	Revision of unit 1 and unit 2		Problems ,if any in any practical and resolve
	44	Revision of unit 3 and unit 4		Problems ,if any in any practical and resolve
	45	Revision of unit 5		Problems ,if any in any practical and resolve