LESSON PLAN

Name of the Faculty : **Dr. JAI PARKASH PANWAR**

Discipline : **ELECTRONICS & COMMUNICATION ENGINEERING**

Semester : **4th**

Subject : **POWER ELECTRONICS**

Lesson Plan Duration : **16 weeks (from 15.02.2024 to 14.06.2024)**

Work Load (Lecture/ Practical) per week (in hours): Lectures-03, Practicals-04

Week	Theory		Practical	
	Lecture Day	Topics (including Assignments/Tests)	Practical Day	Topic
1st	1st	Construction, working principles of SCR, two transistor analogy of SCR, VI characteristics of SCR	1st	To plot VI characteristic of an SCR
	2nd			
	3rd	SCR specifications and ratings		
2nd	4th	Different methods of SCR triggering	2nd	To plot VI characteristics of TRIAC
	5th	Different commutation circuit for SCR		
	6th	Series and parallel operation of SCR		
3rd	7th	Construction & working principle of DIAC& their V-I characteristics	3rd	To plot VI characteristics of UJT
	8th	Construction & working principle of TRIAC& their V-I characteristics		
	9th	Construction, working principle of UJT		
4th	10th	VI characteristics of UJT	4th	To plot VI characteristics of DIAC
	11th	UJT as relaxation oscillator		
	12th	Brief introduction to Gate Turn Off thyristor (GTO), Programmable uni-junction transistor (PUT), MOSFET, IGBT		
5th	13th	Basic idea about the selection of heat sink for thyristors	5th	Study of UJT relaxation oscillator. And observe I/P and O/P wave forms
	14th	Application such as light intensity control, speed control of universal motors, fan regulator, battery charger		
	15th	Assignments and Class Test Unit 1		
6th	16th	Single phase half wave-controlled rectifier with load (R, R-L)	6th	Observation of wave shape of voltage at relevant point of single-phase half wave-controlled rectifier and effect of change of firing angle
	17th	Single phase half controlled full wave rectifier (R, R-L)		
	18th	Fully controlled full wave bridge rectifier		

7th	19th	Single phase full wave centre tap rectifier	7th	Observation of wave shapes of voltage at relevant point of single-phase full wave controlled rectifier and effect of change of firing angle.
	20th	Principle of operation of basic inverter circuits		
	21st	Concepts of duty cycle, series and parallel		
8th	22nd	Square wave Inverters and Sine wave Inverters and their application	8th	Observation of wave shapes and measurement of voltage at relevant points in TRIAC based AC phase control circuit
	23rd	Choppers: introduction		
	24th	Types of choppers (Class A, B, C, D). Step up and step-down choppers.		
9th	25th		9th	VIVA - VOICE
	26th	Cycloconverters: Introduction, types, basic working principle and application.		
	27th			
10th	28th	Dual converters: Introduction, types, basic working principle and application	10th	All files are checked
	29th			
	30th	Assignment and class test		
11th	31st	DC drive control: half wave drives.	11th	Varying lamp intensity and AC fan speed control
	32nd	DC drive control: Full wave drives.		
	33rd	DC drive control: Chopper drives		
12th	34th	AC drive control: Phase control	12th	Installation of UPS system and routine maintenance of batteries
	35th	Constant V/F operation		
	36th	AC drive control: Cycloconverter		
13th	37th	Inverter drives	13th	Speed control of motor using SCRs
	38th	AC drive control applications in Automobile		
	39th	DC drive control applications in Automobile		
14th	40th	Assignments and Class Test Unit 4	14th	VIVA-VOICE
	41st	UPS, on-line		
	42nd	UPS, off-line & its specifications		
15th	43rd	Concept of high voltage DC transmission	15th	All files are checked
	44th	Concepts of SMPS		
	45th	Introduction to solar power plants and their components		
16th	46th	Assignments and Class Test Unit 5	16th	All files are checked
	47th	Revision/test/Old Question Papers		
	48th	Revision/test/Old Question Papers		