



UTKAL INSTITUTE OF ENGINEERING & TECHNOLOGY

DISCIPLINE: Electrical Engineering	SEMESTER: 5th Sem	NAME OF THE TEACHING FACULTY: Er.Y. Rajani		
SUBJECT: POWER ELECTRONICS AND PLC	No of Days/Per week class allotted: 4 Class P/W(60)	Semester From Date:15/09/2022 To Date:22/12/2022 No. Of Weeks: 15		
WEEK	CLASS DAY	THEORY TOPICS	REMARKS	
1 st	1 st	Construction, Operation, V-I characteristics & application of power diode, SCR, DIAC, TRIAC, Power MOSFET, GTO & IGBT	Date	Dean/Principal
	2 nd	Two transistor analogy of SCR.		
	3 rd	Gate characteristics of SCR.		
	4 th	Switching characteristic of SCR during turn on and turn off.		
2 nd	1 st	Doubt clear class		
	2 nd	Turn on methods of SCR, Turn off methods of SCR (Line commutation and Forced commutation)		
	3 rd	Load Commutation, Resonant pulse commutation		
	4 th	Assignment		
3 rd	1 st	Assignment question Discussion		
	2 nd	Voltage and Current ratings of SCR.		
	3 rd	Over voltage protection		
	4 th	Over current protection, Gate protection		
4 th	1 st	General layout diagram of firing circuit, R firing circuits		
	2 nd	R-C firing circuit, UJT pulse trigger circuit		
	3 rd	Synchronous triggering (Ramp Triggering), Design of Snubber Circuits		

	4 th	Controlled rectifiers Techniques(Phase Angle, Extinction Angle control), Single quadrant semi converter, two quadrant full converter and dual Converter		
5 th	1 st	Class Test		
	2 nd	Working of single-phase half wave controlled converter with Resistive and R-L loads		
	3 rd	Understand need of freewheeling diode		
	4 th	Working of single phase fully controlled converter with resistive and R- L loads,Working of three-phase half wave controlled converter with Resistive load		
6 th	1 st	Revision of Last Class		
	2 nd	Assignment		
	3 rd	Working of three phase fully controlled converter with resistive load.		
	4 th	Working of single phase AC regulator, Working principle of step up & step down chopper.		
7 th	1 st	Control modes of chopper , Operation of chopper in all four quadrants		
	2 nd	Classify inverters, Explain the working of series inverter, Explain the working of parallel inverter		
	3 rd	Explain the working of single- phase bridge inverter.		
	4 th	Assignment		
8 th	1 st	Explain the basic principle of Cyclo-converter,Explain the working of single-phase step up & step down Cyclo-converter, Applications of Cyclo-converter		
	2 nd	List applications of power electronic circuits		

	3 rd	List the factors affecting the speed of DC Motors.		
	4 th	Doubt Clearing Class and Assignment Questions Discussion.		
9 th	1 st	Speed control for DC Shunt motor using converter.		
	2 nd	Speed control for DC Shunt motor using chopper.		
	3 rd	Revision Class		
	4 th	List the factors affecting speed of the AC Motors		
10 th	1 st	Speed control of Induction Motor by using AC voltage regulator.		
	2 nd	Speed control of induction motor by using converters and inverters (V/F control), Working of UPS with block diagram.		
	3 rd	Battery charger circuit using SCR with the help of a diagram. , Basic Switched mode power supply (SMPS) - explain its working & applications		
	4 th	Introduction of Programmable Logic Controller(PLC)		
11 th	1 st	Advantages of PLC		
	2 nd	Different parts of PLC by drawing the Block diagram and purpose of each part of PLC		
	3 rd	Class Test		
	4 th	Applications of PLC , Ladder diagram		
12 th	1 st	Doubt Clear Class		
	2 nd	Description of contacts and coils in the following states i)Normally open ii) Normally closed		
	3 rd	iii) Energized output iv)latched Output v) branching		
	4 th	Ladder diagrams for i) AND gate ii) OR gate and iii) NOT gate.		

13 th	1 st	Ladder diagrams for combination circuits using NAND,NOR, AND, OR and NOT , Timers-i)T ON ii) T OFF and iii)Retentive timer		
	2 nd	Counters-CTU, CTD		
	3 rd	Ladder diagrams using Timers and counters		
	4 th	PLC Instruction set		
14 th	1 st	Ladder diagrams for following (i) DOL starter and STAR-DELTA starter		
	2 nd	(ii) Stair case lighting (iii) Traffic light Control (iv) Temperature Controller		
	3 rd	Principle of hybrid stepper motor, Applications of Stepper motor.		
	4 th	Special control systems- Basics DCS & SCADA systems		
15 th	1 st	Special control systems- Basics DCS & SCADA systems		
	2 nd	Computer Control–Data Acquisition, Direct Digital Control System (Basics only)		
	3 rd	Doubt Clear Class		
	4 th	Discussion Sample paper question		

Chittaranjan Parida

HOD

Chittaranjan Parida

DEAN

(Signature)

PRINCIPAL