

LESSON PLAN 2022(WINTER)

Discipline: Electrical Engg.	Semester:5th Sem	Name of the Teaching Faculty: Mrs.JayashreeMohanty,Sr. Lect. Electrical Engg	
Subject: Power Electronics and PLC	Theory Periods: 4P/Week	Semester From Date:-15.09.22 to Date:- 22.12.22	No. of Weeks:18
1 st Week	1st	Construction, Operation, V-I characteristics & application of power diode	
	2nd	Construction, Operation, V-I characteristics & application of SCR	
2 nd Week	1st	Construction, Operation, V-I characteristics & application of DIAC	
	2nd	Construction, Operation, V-I characteristics & application of TRIAC	
	3rd	Construction, Operation, V-I characteristics & application of Power MOSFET	
	4th	Construction, Operation, V-I characteristics & application of GTO	
3 rd Week	1st	Construction, Operation, V-I characteristics & application of IGBT	
	2nd	Two transistor analogy of SCR, Gate characteristics of SCR.	
	3rd	Switching characteristic of SCR during turn on and turn off.	
4 th Week	1st	Turn on methods of SCR,	
6 th Week	1st	Turn off methods of SCR (Line commutation and Forced commutation) (i) Load Commutation (ii) Resonant pulse commutation	
	2nd	Voltage and Current ratings of SCR, Protection of SCR, Over voltage protection	
	3rd	Over current protection, Gate protection	
	4th	Firing Circuits, General layout diagram of firing circuit	
7 th Week	1st	Class test 1	
	2nd	R firing circuit, R-C firing circuit	
	3rd	UJT pulse trigger circuit, Synchronous triggering (Ramp Triggering)	
	4th	Design of Snubber Circuits	
8 th Week	1st	Controlled rectifiers Techniques (Phase Angle, Extinction Angle control), Single quadrant semi converter, two quadrant full converter and dual Converter, Working of single-phase half wave controlled converter with Resistive loads.	
	2nd	Working of single-phase half wave controlled converter with R-L loads, Understand need of freewheeling diode.	
	3rd	Working of single phase fully controlled converter with resistive and R- L loads.	
9 th Week	1st	Working of single phase fully controlled converter with resistive and R- L loads.	
10 th Week	1st	Working of three-phase half wave controlled converter with Resistive load	
	2nd	Working of three phase fully controlled converter with resistive load	
	3rd	Working of single phase AC regulator	
11 th Week	1st	Working principle of step up & step down chopper	
	2nd	Control modes of chopper, Operation of chopper in all four quadrants.	
	3rd	Internal	
	4th	Operation of chopper in all four quadrants.	
12 th Week	1st	Operation of chopper in all four quadrants.	
	2nd	Classify inverters, Explain the working of series inverter.	
	3rd	Explain the working of parallel inverter	
	4th	Explain the working of single-phase bridge inverter.	

Jayashree Mohanty

13 th Week	1st	Explain the basic principle of Cyclo-converter, Explain the working of single-phase step up & step down Cyclo-converter, Applications of Cyclo-converter
	2nd	List applications of power electronic circuits, List the factors affecting the speed of DC Motors, Speed control for DC Shunt motor using converter.
	3rd	Speed control for DC Shunt motor using chopper
	4th	List the factors affecting speed of the AC Motors, Speed control of Induction Motor by using AC voltage regulator.
14 th Week	1st	Speed control of induction motor by using converters and inverters (V/F control).
	2nd	Working of UPS with block diagram.
15 th Week	1st	Battery charger circuit using SCR with the help of a diagram
	2nd	Basic Switched mode power supply (SMPS) - explain its working & applications
16 th Week	1st	Introduction of Programmable Logic Controller (PLC), Advantages of PLC, Different parts of PLC by drawing the Block diagram and purpose of each part of PLC,
	2nd	Ladder diagram, Description of contacts and coils in the following states i) Normally open ii) Normally closed iii) Energized output iv) latched Output v) branching, Ladder diagrams for i) AND gate ii) OR gate and iii) NOT gate
	3rd	Ladder diagrams for combination circuits using NAND, NOR, AND, OR and NOT
	4th	Timers-i) T ON ii) T OFF and iii) Retentive timer
17 th Week	1st	Counters-CTU, CTD, Ladder diagrams using Timers and counters
	2nd	PLC Instruction set, Ladder diagrams for following (i) DOL starter and STAR-DELTA starter
	3rd	Stair case lighting (iii) Traffic light Control (iv) Temperature Controller
	4th	Special control systems- Basics DCS & SCADA systems
18 th Week	1st	Computer Control-Data Acquisition, Direct Digital Control System (Basics only)
	2nd	Class test 2

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