GOVT. POLYTECHNIC MAYURBHANJ
LESSON PLAN

Discipline :	Semester: 5th			Name of the Teaching Faculty : MANOJ KUMAR PRADHAN
Subject :	POWER ELECTRONICS AND PLC.			

No. of Days / per week class allotted : 04	Semester From date : 01.07.2024	To Date : 08.11.2024

MONTH	Week	Day	UNIT	TOPICS
		UNIT-1		**UNDERSTAND THE CONSTRUCTION AND WORKING OF POWER ELECTRONIC DEVICES**
JULY	Week 1	2nd	UNIT - 1	Construction, Operation, V-I characteristics & application of power diode.
		4th		SCR, DIAC,
		5th		TRIAC, Power MOSFET
		6th		GTO &IGBT
	Week 2	2nd		Two transistor analogy of SCR.
		4th		Gate characteristics of SCR.
		5th		Switching characteristic of SCR during turn on and turn off.
		6th		Turn on methods of SCR.
	Week 3	2nd		Turn off methods of SCR (Line commutation and Forced commutation)
		4th		Voltage and Current ratings of SCR.
		5th		Protection of SCR 1.8.1 Over voltage protection
		6th		Over current protection 1.8.3 Gate protection
	Week 4	2nd		Firing Circuits 1.9.1 General layout diagram of firing circuit 1.9.2 R firing circuits
		4th		R-C firing circuit 1.9.4 UJT pulse trigger circuit
		5th		Synchronous triggering (Ramp Triggering)
		6th		Design of Snubber Circuits.
	Week 5	2nd		REVISION
		UNIT-2		**UNDERSTAND THE WORKING OF CONVERTERS, AC REGULATORS AND CHOPPERS.**
AUGUST	Week 1	4th	UNIT - 2	Controlled rectifiers Techniques(Phase Angle, Extinction Angle control)
		5th		Single quadrant semi converter, two quadrant full converter and dual Converter
		6th		Working of single-phase half wave controlled converter with Resistive and R-L loads.
	Week 2	2nd		Understand need of freewheeling diode
		4th		Working of single phase fully controlled converter with resistive and R- L loads
		5th		Working of three-phase half wave controlled converter with Resistive load
		6th		Working of three phase fully controlled converter with resistive load
	Week 3	2nd		Working of single phase AC regulator
		5th		Working principle of step up & step down chopper.
		6th		**MONTHLY TEST-1**
	Week 4	2nd		Control modes of chopper. Operation of chopper in all four quadrants
		4th		REVISION
				UNDERSTAND THE INVERTERS AND CYCLO-CONVERTERS
		5th	UNIT - 3	Classify inverters.Explain the working of series inverter.
		6th		Explain the working of parallel inverter.
	Week 5	2nd		Explain the working of single-phase bridge inverter.
		4th		Explain the basic principle of Cyclo-converter
		5th		Explain the working of single-phase step up & step down Cyclo-converter
		6th		Applications of Cyclo-converter.
SEPTEMBER	Week 1	2nd		REVISION
				UNDERSTAND APPLICATIONS OF POWER ELECTRONIC CIRCUITS
		4th	UNIT - 4	List applications of power electronic circuits
		5th		List the factors affecting the speed of DC Motors.
	Week 2	2nd		Speed control for DC Shunt motor using converter.
		4th		Speed control for DC Shunt motor using chopper.
		5th		List the factors affecting speed of the AC Motors
		6th		Speed control of Induction Motor by using AC voltage regulator
	Week 3	2nd		Speed control of induction motor by using converters and inverters (V/F control)
		4th		Working of UPS with block diagram
		5th		Battery charger circuit using SCR with the help of a diagram
		6th		**INTERNAL ASSESMENT**
	Week 4	2nd		Basic Switched mode power supply (SMPS) - explain its working & applications
		4th		REVISION
				PLC AND ITS APPLICATIONS
		5th		Introduction of Programmable Logic Controller(PLC)
		6th		Advantages of PLC.
OCTOBER	Week 1	2nd	UNIT - 5	Different parts of PLC by drawing the Block diagram and purpose of each part of PLC
		4th		Applications of PLC. Ladder diagram
		5th		Description of contacts and coils in the following states i)Normally open ii) Normally closed
		6th		Description of contacts and coils in the following states iii) Energized output iv)latched Output v) branching
	Week 2	2nd		Ladder diagrams for i) AND gate ii) OR gate and iii) NOT gate iv) NAND gate v) NOR gate
		4th		Ladder diagrams for combination circuits using AND, OR and NOT
		5th		Timers-i)T ON ii) T OFF and iii)Retentive timer
		6th		Counters-CTU, CTD
	Week 3	2nd		Ladder diagrams using Timers and counter. PLC Instruction set
		4th		Ladder diagrams for following (i) DOL starter and STAR-DELTA starter
		5th		Ladder diagrams for following (ii) Stair case lighting
		6th		Ladder diagrams for following (iii) Traffic light Control

	Week 4	2nd	Ladder diagrams for following (iv) Temperature Controller
NOVEMBER	Week 1	5th	Special control systems- Basics DCS & SCADA systems
		6th	Computer Control–Data Acquisition, Direct Digital Control System (Basics only)
	Week 2	2nd	REVISION
		4th	MONTHLY TEST-2
		5th	REVISION