

## GOVT. POLYTECHNIC MAYURBHANJ LESSON PLAN

Discipline :		Semester: 5th Sem		Name of the Teaching Faculty : ISWAR KUMAR SAHU	
Subject :		POWER ELECTRONICS AND PLC.			
No. of Days / per week class allotted : 04				Semester From date : 01.09.2023 To Date : 30.11.2023	
MONTH	Week	Day	UNIT	TOPICS	
AUGUST	1st	2nd	UNIT-1	UNDERSTAND THE CONSTRUCTION AND WORKING OF POWER ELECTRONIC DEVICES	
		3rd		Construction, Operation, V-I characteristics & application of power diode.	
		5th		SCR, DIAC,	
	2nd	1st		TRIAC, Power MOSFET	
		2nd		GTO &IGBT	
		3rd		Two transistor analogy of SCR.	
		5th		Gate characteristics of SCR.	
	3rd	1st		Switching characteristic of SCR during turn on and turn off.	
		2nd		Turn on methods of SCR.	
		3rd		Turn off methods of SCR (Line commutation and Forced commutation)	
		5th		Voltage and Current ratings of SCR.	
	4th	1st		Protection of SCR 1.8.1 Over voltage protection	
		2nd		Over current protection 1.8.3 Gate protection	
		3rd		Firing Circuits 1.9.1 General layout diagram of firing circuit 1.9.2 R firing circuits	
		5th		R-C firing circuit 1.9.4 UJT pulse trigger circuit	
	5th	1st		Synchronous triggering (Ramp Triggering )	
		2nd		Design of Snubber Circuits.	
		3rd	UNIT-2	UNDERSTAND THE WORKING OF CONVERTERS, AC REGULATORS AND CHOPPERS.	
SEPTEMBER	1st	5th		Controlled rectifiers Techniques(Phase Angle, Extinction Angle control)	
	2nd	1st		Single quadrant semi converter, two quadrant full converter and dual Converter	
		2nd		Working of single-phase half wave controlled converter with Resistive and R-L loads.	
		3rd		Understand need of freewheeling diode	
		5th		Working of single phase fully controlled converter with resistive and R- L loads	
	3rd	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	
		5th		CLASS TEST-1	
		1st		Working principle of step up & step down chopper.	

S	4th	2nd		Control modes of chopper. Operation of chopper in all four quadrants
		3rd	<b>UNIT-3</b>	<b>UNDERSTAND THE INVERTERS AND CYCLO-CONVERTERS</b>
		5th		Classify inverters.Explain the working of series inverter.
	5th	1st		Explain the working of parallel inverter.
		2nd		Explain the working of single-phase bridge inverter.
		3rd		Explain the basic principle of Cyclo-converter
		5th		Explain the working of single-phase step up & step down Cyclo-converter
OCTOBER	1st	1st		Applications of Cyclo-converter.
		2nd	<b>UNIT-4</b>	<b>UNDERSTAND APPLICATIONS OF POWER ELECTRONIC CIRCUITS</b>
		3rd		List applications of power electronic circuits
		5th		List the factors affecting the speed of DC Motors.
	2nd	1st		Speed control for DC Shunt motor using converter.
		2nd		Speed control for DC Shunt motor using chopper.
		3rd		List the factors affecting speed of the AC Motors
		5th		Speed control of Induction Motor by using AC voltage regulator
	3rd	1st		Speed control of induction motor by using converters and inverters (V/F control)
		2nd		Working of UPS with block diagram
		3rd		Battery charger circuit using SCR with the help of a diagram
		5th		<b>INTERNAL ASSESMENT</b>
	4th	1st		Basic Switched mode power supply (SMPS) - explain its working & applications
		2nd	<b>UNIT-5</b>	<b>PLC AND ITS APPLICATIONS</b>
		3rd		Introduction of Programmable Logic Controller(PLC)
		5th		Advantages of PLC.
	5th	1st		Different parts of PLC by drawing the Block diagram and purpose of each part of PLC
		2nd		Applications of PLC. Ladder diagram
NOVEMBER	1st	3rd		Description of contacts and coils in the following states i)Normally open ii) Normally closed
		5th		Description of contacts and coils in the following states iii) Energized output iv)latched Output v) branching
	2nd	1st		Ladder diagrams for i) AND gate ii) OR gate and iii) NOT gateRevision
		2nd		Ladder diagrams for combination circuits using NAND,NOR
		3rd		Ladder diagrams for combination circuits using AND, OR and NOT
		5th		Timers-i)T ON ii) T OFF and iii)Retentive timer
	3rd	1st		Counters-CTU, CTD
		2nd		Ladder diagrams using Timers and counter. PLC Instruction set
		3rd		Ladder diagrams for following (i) DOL starter and STAR-DELTA starter
		5th		Ladder diagrams for following (ii) Stair case lighting
		1st		Ladder diagrams for following (iii) Traffic light Control

	4th	2nd		Ladder diagrams for following (iv) Temperature Controller
		3rd		Special control systems- Basics DCS & SCADA systems
		5th		Computer Control–Data Acquisition, Direct Digital Control System (Basics only)
	5th	1st		<b>REVISION</b>
		2nd		<b>REVISION</b>
		3rd		<b>CLASS TEST-2</b>