SYNERGY POLYTECHNIC, BBSR

The Lesson Plan

Descipline: Electrical Engineering(EE)	Semester: 5th	Name of the Teaching Faculty: Soumyashree Mohapatra
Subject:POWER ELECTRONICS AND PLC	No of Days/per week class allotted:04	Semester from Date: 01.08.2023 to Date: No of Weeks:
Week	Class Day	Theory/Practical Topics
1st MODULE 1 CONSTRUCTION AND WORKING OF POWER ELECTRONIC DEVICES	1st	Power diode, SCR
	2nd	DIAC,TRIAC
	3rd	Power MOSFET
	4th	GTO &IGBT
	5th	
2nd MODULE 1 CONSTRUCTION AND WORKING OF POWER ELECTRONIC DEVICES	1st	Two transistor analogy of SCR.
	2nd	Gate characteristics of SCR.
	3rd	Switching characteristic of SCR during turn on and turn off.
	4th	Turn on methods of SCR
	5th	
3rd MODULE 1 CONSTRUCTION AND WORKING OF POWER ELECTRONIC DEVICES	1st	Turn off methods of SCR (Line commutation and Forced commutation)
	2nd	Protection of SCR
	3rd	Firing Circuits -R firing circuits, R-C firing circuit
	4th	UJT pulse trigger circuit, Synchronous triggering (Ramp Triggering)
	5th	
4th MODULE II WORKING OF CONVERTERS, AC REGULATORS AND CHOPPERS.	1st	Controlled rectifiers Techniques
	2nd	Working of single-phase half wave controlled converter with Resistive and R-L loads.
	3rd	single phase fully controlled converter with resistive and R- L loads.
	4th	three-phase half wave controlled converter with Resistive load
	5th	
5th MODULE II WORKING OF CONVERTERS, AC REGULATORS AND CHOPPERS.	1st	three phase fully controlled converter with resistive load.
	2nd	single phase AC regulator
	3rd	step up & step down chopper.
	4th	Control modes of chopper
	5th	

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1st **MODULE III INVERTERS AND CYCLO-CONVERTERS**	1st	working of series inverter.
	2nd	working of parallel inverter
	3rd	working of single-phase bridge inverter
	4th	basic principle of Cyclo-converter
	5th	
2nd **MODULE III INVERTERS AND CYCLO-CONVERTERS**	1st	working of single-phase step up
	2nd	step down Cyclo-converter.
	3rd	Applications of Cyclo-converter.
	4th	List applications of power electronic circuits
	5th	
3rd **MODULE IV APPLICATIONS OF POWER ELECTRONIC CIRCUITS**	1st	List the factors affecting the speed of DC Motors.
	2nd	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.
	5th	
4th **MODULE IV APPLICATIONS OF POWER ELECTRONIC CIRCUITS**	1st	Speed control of Induction Motor by using AC voltage regulator
	2nd	Speed control of induction motor by using converters and inverters (V/F control).
	3rd	Working of UPS with block diagram.
	4th	Battery charger circuit using SCR with the help of a diagram.
	5th	
5th **MODULE V PLC AND ITS APPLICATIONS**	1st	Basic Switched mode power supply (SMPS) -
	2nd	Introduction of Programmable Logic Controller(PLC)
	3rd	Different parts of PLC by drawing the Block diagram and purpose of each part of PLC
	4th	Ladder diagram
	5th	

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1st MODULE V PLC AND ITS APPLICATIONS	1st	Description of contacts and coils in the following states i)Normally open ii) Normally closed iii) Energized output
	2nd	iv)latched Output v) branching
	3rd	Ladder diagrams for i) AND gate ii) OR gate and iii) NOT gate.
	4th	Ladder diagrams for combination circuits using NAND,NOR, AND, OR and NOT
	5th	
2nd MODULE V PLC AND ITS APPLICATIONS	1st	Timers-i)T ON ii) T OFF and iii)Retentive timer
	2nd	Counters-CTU, CTD
	3rd	Ladder diagrams using Timers and counters
	4th	PLC Instruction set
	5th	
3rd MODULE V PLC AND ITS APPLICATIONS	1st	Ladder diagrams for following (i) DOL starter and STAR-DELTA starter (ii) Stair case lighting
	2nd	(iii) Traffic light Control (iv) Temperature Controller
	3rd	Special control systems- Basics DCS & SCADA systems
	4th	Computer Control–Data Acquisition, Direct Digital Control System
	5th	
4th	1st	
	2nd	
	3rd	
	4th	
	5th	
5th	1st	
	2nd	
	3rd	
	4th	
	5th	

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