

Discipline Electrical Engg.	Semester 5th	Name of the Teaching Faculty J. K. Mishra.
Subject :- power Electronics and PLC (PE & PLC)	No of days per week :- 64 (04)	Semester from : 01.10.2021 To : 08.01.2022 No of weeks = 15

Month	weeks	class day	topics
OCTOBER	1st	1st	1. UNDERSTANDING THE CONSTRUCTION AND WORKING OF POWER ELECTRONIC DEVICES 1
			1.1 Construction, operation, v-i characteristics & application of power diode, SCR, DIAC, TRIAC, POWER MOSFET GTO & IGBT
		2nd	CONTINUE
		3rd	CONTINUE
		4th	1.2 Two transistor analogy of SCR
	2nd	1st	1.3 Gate characteristics of SCR
		2nd	1.4 switching characteristics of SCR during turn on & turn off

month	week	class day	Topic To be covered
		3rd	1.5 Turn on Methods of SCR
		4th	1.6 Turn off Methods of SCR. (Line communication & forced communication) 1.6.1 Load communication
	3rd	1st	1.6.2 Resonant pulse communication
		2nd	1.7 Voltage & current ratings of SCR
		3rd	1.8 protection of SCR 1.8.1 over voltage protection
		4th	1.8.2 over current protection
	4th	1st	1.8.3 Gate protection
		2nd	1.9. Firing circuits 1.9.1 General layout diagram of firing circuit 1.9.2 R Firing circuits

Month	week	class day	Topic To be covered
		3rd	1.9.3 R-c Firing circuit
		4th	1.9.4 UJT Pulse trigger circuit
NOVEMBER	1st	1st	1.9.5 Synchronous triggering (Ramp Triggering)
		2nd	1.10 Design of snubber circuits
		3rd	2 - UNDERSTAND THE WORKING OF CONVERTERS (AC REGULATORS AND) CHOPPERS
		4th	2.1 controlled rectifiers Techniques (Phase Angle, Extinction, Angle control)
	2nd	1st	single quadrant semi converter two quadrant full converter and dual converter
		2nd	2.2 working of single-phase half wave controlled converter with resistive & R-L Loads
		3rd	continue

Month	week	class day	Topic To be covered
		4th	2.3 Understand need of free wheeling diode
	3rd	1st	2.4 Working of single phase fully controlled converter with resistive and R-L Loads
		2nd	2.5 Working of three phase half wave controlled converter with resistive load.
		3rd	2.6 Working of three phase fully controlled converter with resistive load
		4th	2.7 Working of single phase AC Regulator
	4th	1st	2.8 Working principle of step up & step down chopper
		2nd	2.9 Control modes of chopper
			2.10 operation of chopper in all four quadrants

month	week	class day	Topic to be covered
		3rd	3. UNDERSTAND THE INVERTERS AND CYCLO-CONVERTERS
			3.1. classify inverters
		4th	3.2 Explain the working of Series inverter
DECEMBER	1st	1st	3.3 Explain the working of parallel inverter
		2nd	3.4 Explain the working of single phase bridge inverter
		3rd	3.5 Explain the basic principle of cyclo-converter
		4th	3.6 Explain the working of single phase step up & step down cyclo converter
	2nd	1st	continue
		2nd	3.7 Application of cyclo-converter

Month	Week	Class day	Topic to be covered
		3rd	4. UNDERSTAND APPLICATIONS OF POWER ELECTRONIC CIRCUITS
		4th	4.1. List applications of power electronic circuits
	3rd	1st	4.2 List the factors affecting the speed of DC motors
		2nd	4.3 Speed control for DC shunt motor using chopper
		3thrd	4.4 Speed control for DC shunt motor using chopper.
		4th	4.5 List the factors affecting speed of the AC Motors
	4th	1st	4.6 Speed control of induction motor by using AC voltage regulator
		2nd	4.7 Speed control of induction motor by using converters & inverters (V/F control)

Month	Week	Class day	Topic to be covered
		3rd	4.8 working of ups with block diagram
		4th	4.9 Battery charger circuit using sek with the help of a diagram
			4.10 Basic switched Mode power supply (SMPS) - explain its working & application.
JANUARY	1st	1st	5. PLC AND ITS APPLICATIONS
			5.1 Introduction of programmable logic controller (PLC)
		2nd	5.2 Advantages of PLC 5.3 Different parts of PLC by drawing the block diagram & purpose of each part of PLC
		3rd	5.4 Application of PLC
		4th	5.5 Ladder diagram

Month	Week	Class day	Topic To be covered
		2nd	5.6 Description of contacts & coil in the following states i) Normally open ii) Normally closed iii) Energized output iv) Latched output v) branching
		2nd	5.7. Ladder diagrams for i) AND gate ii) OR gate iii) Not gate
		3rd	5.8 Ladder diagrams for combination circuits using NAND, NOR, AND, OR and NOT.
		4th	5.9 Timers i) T ON ii) T off & iii) Retentive timer
	3rd	1st	5.10 Counters - CTD, CTD 5.11. Ladder diagrams using Timers and counters 5.12. PLC instruction set

Month	Week	Class day	Topic To be covered
		2nd	5.13 Ladder diagrams for following i) DOL starter & star-delta starter ii) Stair case lighting iii) Traffic light control iv) Temperature controller
		3rd	5.14 Special control systems - Base PCS & SCADA systems
		4th	5.15 Computer control - Data acquisition, Direct digital control system (basics only)