

Gandhi Polytechnic, Golanthara

Dept. of Electrical Engineering

LESSON PLAN

Subject :		POWER ELECTRONICS AND PLC	
Discipline: Electrical Engineering		Name of the Faculty: Er.Amiya Ranjan Lenka	
Course Code:	TH-5	Semester:	5 TH
Total Periods:	60	Examination:	2022(Winter)
Theory Periods:	4P/W	Class Test:	20
Maximum Marks:	100	End Semester Examination:	80
No's of Week	Periods in week	Theory Topics	
1st	1st	1.1 Construction, Operation, V-I characteristics & application of power diode, SCR, DIAC, TRIAC, Power MOSFET, GTO & IGBT	
	2nd	1.2 Two transistor analogy of SCR.	
	3rd	1.3 Gate characteristics of SCR.	
	4th	1.4 Switching characteristic of SCR during turn on and turn off.	
2nd	1st	1.5 Turn on methods of SCR.	
	2nd	1.6 Turn off methods of SCR (Line commutation and Forced commutation) 1.6.1 Load Commutation 1.6.2 Resonant pulse commutation	
	3rd	1.7 Voltage and Current ratings of SCR.	
	4th	1.8 Protection of SCR 1.8.1 Over voltage protection 1.8.2 Over current protection 1.8.3 Gate protection	
3rd	1st	1.9 Firing Circuits 1.9.1 General layout diagram of firing circuit 1.9.2 R firing circuits 1.9.3 R-C firing circuit 1.9.4 UJT pulse trigger circuit 1.9.5 Synchronous triggering (Ramp Triggering)	
	2nd	1.10 Design of Snubber Circuits	
	3rd	2.1 Controlled rectifiers Techniques(Phase Angle, Extinction Angle control), Single quadrant semi converter, two quadrant full converter and dual Converter.	
	4th	2.2 Working of single-phase half wave controlled converter with Resistive and R-L loads	
4th	1st	. 2.3 Understand need of freewheeling diode	
	2nd	. 2.4 Working of single phase fully controlled converter with resistive and R-L loads	
	3rd	2.5 Working of three-phase half wave controlled converter with Resistive load	
	4th	2.6 Working of three phase fully controlled converter with resistive load.	
5th	1st	.2.7 Working of single phase AC regulator. 2.8 Working principle of step up & step down chopper	
	2nd	2. 2.10 Operation of chopper in all four quadrants 9 Control modes of chopper	
	3rd	3.1 Classify inverters.	
	4th	3.2 Explain the working of series inverter. 3.3 Explain the working of parallel inverter	
6th	1st	3.4 Explain the working of single-phase bridge inverter. V- Semester Electrical	
	2nd	3.5 Explain the basic principle of Cyclo-converter	
	3rd	3.6 Explain the working of single-phase step up & step down Cyclo-converter	
	4th	... 3.7 Applications of Cyclo-converter	
7th	1st	4.1 List applications of power electronic circuits.	
	2nd	4.2 List the factors affecting the speed of DC Motors.	
	3rd	4.3 Speed control for DC Shunt motor using converter.	
	4th	4.4 Speed control for DC Shunt motor using chopper.	

8th	1st	4.5 List the factors affecting speed of the AC Motors.
	2nd	4.6 Speed control of Induction Motor by using AC voltage regulator.
	3rd	4.7 Speed control of induction motor by using converters and inverters(V/F control).
	4th	4.8 Working of UPS with block diagram.
9th	1st	4.9 Battery charger circuit using SCR with the help of a diagram.
	2nd	4.10 Basic Switched mode power supply (SMPS) - explain its working & applications
	3rd	5.1 Introduction of Programmable Logic Controller(PLC)
	4th	5.2 Advantages of PLC
10th	1st	5.3 Different parts of PLC by drawing the Block diagram and purpose of each part of PLC.
	2nd	5.4 Applications of PLC
	3rd	5.5 Ladder diagram.
	4th	5.6 Description of contacts and coils in the following states i)Normally open ii) Normally closed iii) Energized output iv)latched Output v) branching
11th	1st	5.7 Ladder diagrams for i) AND gate ii) OR gate and iii) NOT gate.
	2nd	5.8 Ladder diagrams for combination circuits using NAND,NOR, AND,OR and NOT
	3rd	5.9 Timers-i)T ON ii) T OFF and iii)Retentive timer
	4th	5.10Counters-CTU, CTD
12th	1st	5.11 Ladder diagrams using Timers and counters
	2nd	5.12 PLC Instruction set
	3rd	5.13 Ladder diagrams for following(i) DOL starter and STAR-DELTA starter (ii) Stair case lighting (iii) Traffic light Control (iv) Temperature Controller
	4th	5.14 Special control systems- Basics DCS & SCADA systems
13th	1st	5.15 Computer Control–Data Acquisition, Direct Digital Control System (Basics only)
	2nd	Revisions
	3rd	Revisions
	4th	Revisions
14th	1st	Revisions
	2nd	Revisions
	3rd	Revisions
	4th	Revisions
15th	1st	Revisions
	2nd	Revisions
	3rd	Revisions
	4th	Revisions