



LESSON PLAN

SUBJECT: Th-5 (POWER ELECTRONICS AND PLC)

CHAPTER WISE DISTRIBUTION OF PERIODS

Sl.No.	Name of the chapter as per the Syllabus	No of Periods as per the syllabus	No. of periods actually needed
1	Understand The Construction And Working Of Power Electronic Devices	18	18
2	Understand The Working Of Converters, Ac Regulators And Choppers.	12	12
3	Understand The Inverters And Cyclo-Converters	8	8
4	Understand Applications Of Power Electronic Circuits	10	10
5	PLC And Its Applications	12	12
	Total Period:	60	60

Discipline: EEE	Semester: 5 th	Name of the Teaching Faculty: Er. PRAKASH KUMAR MOHANTY
Week	Class Day	Theory / Practical Topics
1st	1 st	1.1 Construction, Operation, V-I characteristics & application of power diode, SCR, DIAC, TRIAC, Power MOSFET, GTO & IGBT
	2 nd	1.2 Two transistor analogy of SCR.
	3 rd	1.3 Gate characteristics of SCR.
	4 th	1.4 Switching characteristic of SCR during turn on and turn off.
2nd	1 st	1.5 Turn on methods of SCR.
	2 nd	1.6 Turn off methods of SCR (Line commutation and Forced commutation) 1.6.1 Load Commutation
	3 rd	1.6.2 Resonant pulse commutation
	4 th	1.7 Voltage and Current ratings of SCR.
3rd	1 st	Protection of SCR Over voltage protection
	2 nd	1.8.2 Over current protection
	3 rd	1.8.3 Gate protection
	4 th	Firing Circuits General layout diagram of firing circuit
4th	1 st	1.9.2 R firing circuits

4th	2 nd	1.9.3 R-C firing circuit
	3 rd	1.9.4 UJT pulse trigger circuit
	4 th	1.9.5 Synchronous triggering (Ramp Triggering)
5th	1 st	1.10 Design of Snubber Circuits
	2 nd	2.1 Controlled rectifiers Techniques(Phase Angle, Extinction Angle control), Single quadrant semi converter, two quadrant full converter and dual
	3 rd	2.2 Working of single-phase half wave controlled converter with Resistive and R-L loads.
	4 th	2.3 Understand need of freewheeling diode.
6th	1 st	2.4 Working of single phase fully controlled converter with resistive and R- L loads.
	2 nd	2.5 Working of three-phase half wave controlled converter with Resistive load
	3 rd	2.6 Working of three phase fully controlled converter with resistive load.
	4 th	2.7 Working of single phase AC regulator.
7th	1 st	2.8 Working principle of step up & step down chopper.
	2 nd	2.9 Control modes of chopper
	3 rd	2.10 Operation of chopper in all four quadrants.
	4 th	3.1 Classify inverters.
8th	1 st	3.2 Explain the working of series inverter.

8th	2 nd	3.3 Explain the working of parallel inverter
	3 rd	3.4 Explain the working of single-phase bridge inverter.
	4 th	3.5 Explain the basic principle of Cyclo-converter.
9th	1 st	3.6 Explain the working of single-phase step up & step down Cyclo- converter.
	2 nd	3.7 Applications of Cyclo-converter.
	3 rd	4.1 List applications of power electronic circuits.
	4 th	4.2 List the factors affecting the speed of DC Motors.
10th	1 st	4.3 Speed control for DC Shunt motor using converter.
	2 nd	4.4 Speed control for DC Shunt motor using chopper.
	3 rd	4.5 List the factors affecting speed of the AC Motors.
	4 th	4.6 Speed control of Induction Motor by using AC voltage regulator.
11th	1 st	4.7 Speed control of induction motor by using converters and inverters (V/F control).
	2 nd	4.8 Working of UPS with block diagram.
	3 rd	4.9 Battery charger circuit using SCR with
	4 th	4.10 Basic Switched mode power supply (SMPS) - explain its working & applications
12th	1 st	5.1 Introduction of Programmable Logic Controller(PLC)

12th	2 nd	5.2 Advantages of PLC
	3 rd	5.3 Different parts of PLC by drawing the Block diagram and purpose of each part of PLC.
	4 th	5.4 Applications of PLC
13th	1 st	5.5 Ladder diagram
	2 nd	5.6 Description of contacts and coils in the following states i) Normally open ii) Normally closed iii) Energized output iv) latched Output v)
	3 rd	5.7 Ladder diagrams for i) AND gate ii) OR gate and iii) NOT gate.
	4 th	5.8 Ladder diagrams for combination circuits using NAND, NOR, AND, OR and NOT
14th	1 st	5.9 Timers-i) T ON ii) T OFF and iii) Retentive timer
	2 nd	5.10 Counters-CTU, CTD
	3 rd	5.11 Ladder diagrams using Timers and counters
	4 th	5.12 PLC Instruction set
15th	1 st	5.13 Ladder diagrams for following (i) DOL starter and STAR-DELTA starter (ii) Stair case lighting (iii) Traffic light
	2 nd	5.14 Special control systems- Basics DCS & SCADA systems
	3 rd	5.15 Computer Control–Data Acquisition, Direct Digital Control System (Basics only)
	4 th	CLASS TEST

Sign of Faculty

sign.of Department Head