ACADEMIC LESSON PLAN

Discipline: E & TC Engg.	Semester: 5th	Name of the Teaching Faculty:
Subject: PE&PLC	No. of days/per week class allotted:4p/week	Semester From: No. of Weeks: 15 weeks
Week	Class Day	Theory Topics
1st	1st	**1. UNDERSTAND THE CONSTRUCTION AND WORKING OF POWER ELECTRONIC** DEVICES 1.1 Construction, Operation, V-I characteristics & application of power diode, SCR, DIAC,TRIAC, Power MOSFET,GTO &IGBT(CONTD.)
	2nd	1.1 Construction, Operation, V-I characteristics & application of power diode, SCR, DIAC,TRIAC, Power MOSFET,GTO &IGBT
	3rd	1.2 Two transistor analogy of SCR.
	4th	1.3 Gate characteristics of SCR.
2nd	1st	1.4 Switching characteristic of SCR during turn on and turn off. (CONTD.)
	2nd	1.4 Switching characteristic of SCR during turn on and turn off.
	3rd	1.5 Turn on methods of SCR.
	4th	1.6 Turn off methods of SCR (Line commutation and Forced commutation) 1.6.1 Load Commutation
3rd	1st	1.6.2 Resonant pulse commutation
	2nd	1.7 Voltage and Current ratings of SCR.
	3rd	1.8 Protection of SCR 1.8.1 Over voltage protection
	4th	1.8.2 Over current protection 1.8.3 Gate protection
4th	1st	1.9 Firing Circuits 1.9.1 General layout diagram of firing circuit
	2nd	1.9.2 R firing circuits
	3rd	1.9.3 R-C firing circuit
	4th	1.9.4 UJT pulse trigger circuit
5th	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.** 2.1 Controlled rectifiers Techniques(Phase Angle, Extinction Angle control), Single quadrant semi converter, two quadrant full converter and dual Converter.(CONTD.)
	4th	2.1 Controlled rectifiers Techniques(Phase Angle, Extinction Angle control), Single quadrant semi converter, two quadrant full converter and dual Converter.
6th	1st	2.2 Working of single-phase half wave controlled converter with Resistive and R-L loads.
	2nd	2.3 Understand need of freewheeling diode.
	3rd	2.4 Working of single phase fully controlled converter with resistive and R- L loads.

	4th	2.5 Working of three-phase half wave controlled converter with Resistive load
7th	1st	2.6 Working of three phase fully controlled converter with resistive load.
	2nd	2.7 Working of single phase AC regulator.
	3rd	2.8 Working principle of step up & step down chopper. .
	4th	2.9 Control modes of chopper
8th	1st	2.10 Operation of chopper in all four quadrants(CONTD.)
	2nd	2.10 Operation of chopper in all four quadrants
	3rd	**3. UNDERSTAND THE INVERTERS AND CYCLO-CONVERTERS** 3.1 Classify inverters.
	4th	3.2 Explain the working of series inverter.
9th	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.(CONTD.)
10th	1st	3.6 Explain the working of single-phase step up & step down Cyclo-converter.
	2nd	3.7 Applications of Cyclo-converter.
	3rd	**4. UNDERSTAND APPLICATIONS OF POWER ELECTRONIC CIRCUITS** 4.1 List applications of power electronic circuits.
	4th	4.2 List the factors affecting the speed of DC Motors.
11th	1st	4.3 Speed control for DC Shunt motor using converter.
	2nd	4.4 Speed control for DC Shunt motor using chopper.
	3rd	4.5 List the factors affecting speed of the AC Motors.
	4th	4.6 Speed control of Induction Motor by using AC voltage regulator.
12th	1st	4.7 Speed control of induction motor by using converters and inverters (V/F control).
	2nd	4.8 Working of UPS with block diagram.
	3rd	4.9 Battery charger circuit using SCR with the help of a diagram.
	4th	4.10 Basic Switched mode power supply (SMPS) - explain its working & applications
13th	1st	**5. PLC AND ITS APPLICATIONS** 5.1 Introduction of Programmable Logic Controller(PLC) 5.2 Advantages of PLC
	2nd	5.3 Different parts of PLC by drawing the Block diagram and purpose of each part of PLC. 5.4 Applications of PLC
	3rd	5.5 Ladder diagram 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
	4th	5.7 Ladder diagrams for i) AND gate ii) OR gate and iii) NOT gate.

14th	1st	5.8 Ladder diagrams for combination circuits using NAND,NOR, AND, OR and NOT
	2nd	5.9 Timers-i)T ON ii) T OFF and iii)Retentive timer
	3rd	5.10 Counters-CTU, CTD
	4th	5.11 Ladder diagrams using Timers and counters
15th	1st	5.12 PLC Instruction set
	2nd	5.13 Ladder diagrams for following (i) DOL starter and STAR-DELTA starter (ii) Stair case lighting (iii) Traffic light Control (iv) Temperature Controller
	3rd	5.14 Special control systems- Basics DCS & SCADA systems
	4th	5.15 Computer Control–Data Acquisition, Direct Digital Control System (Basics only)
16th	1st	Revision Class
	2nd	Revision Class
	3rd	Revision Class
	4th	Revision Class
17th	1st	Revision Class
	2nd	Revision Class
	3rd	Revision Class
	4th	Revision Class