

# Lesson Plan

2023(w)

Subject :- POWER ELECTRONICS AND PLC (Code) TH-5 Name of faculty:- Harekrishna Sahoo

Semester :-5<sup>th</sup> Class allotted 4p/w Branch :- Electrical Engineering

Discipline	Semester:-5th	From date:-01/08/23 To date:30/11/23	Teaching Aid
Subject:	No. of days/ per week 4p/w:	Theory/ Practical –Topics/Lesson	
Week	Date/Period		

1	01/08/23 to 05/08/23	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 1.2 Two transistor analogy of SCR. 1.3 Gate characteristics of SCR. 1.4 Switching characteristic of SCR during turn on and turn off.	White board & marker
2	07/08/23 to 12/08/23	1.5 Turn on methods of SCR. 1.6 Turn off methods of SCR (Line commutation and Forced commutation) 1.6.1 Load Commutation 1.6.2 Resonant pulse commutation 1.7 Voltage and Current ratings of SCR. 1.8 Protection of SCR 1.8.1 Over voltage protection 1.8.2 Over current protection 1.8.3 Gate protection	White board & marker
3	14/08/23 to 9/08/23	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 ) 1.10 Design of Snubber Circuits	White board & marker
4	21/08/23 to 6/08/23	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 2.2 Working of single-phase half wave controlled converter with Resistive and R-L loads	White board & marker

5	28/08/23 2/09/23	2.3 Understand need of freewheeling diode. 2.4 Working of single phase fully controlled converter with resistive and R- L loads. 2.5 Working of three-phase half wave controlled converter with Resistive load 2.6 Working of three phase fully controlled converter with resistive loa	White board & marker
6	04/09/23 to 09/09/23	2.7 Working of single phase AC regulator. 2.8 Working principle of step up & step down chopper. 2.9 Control modes of chopper 2.10 Operation of chopper in all four quadrants.	White board & marker
7	11/09/23 to 16/09/23	3. UNDERSTAND THE INVERTERS AND CYCLO-CONVERTERS 3.1 Classify inverters. 3.2 Explain the working of series inverter. 3.3 Explain the working of parallel inverter 3.4 Explain the working of single-phase bridge inverter	White board & marker
8	18/09/23 to 23/09/23	3.5 Explain the basic principle of Cyclo-converter. 3.6 Explain the working of single-phase step up & step down Cyclo-converter. 3.7 Applications of Cyclo-converter.	White board & marker
9	25/09/23 to 30/09/23	4. UNDERSTAND APPLICATIONS OF POWER ELECTRONIC CIRCUITS 4.1 List applications of power electronic circuits. 4.2 List the factors affecting the speed of DC Motors. 4.3 Speed control for DC Shunt motor using converter. 4.4 Speed control for DC Shunt motor using chopper	White board & marker
10	03/10/23 to 07/10/23	4.5 List the factors affecting speed of the AC Motors. 4.6 Speed control of Induction Motor by using AC voltage regulator. 4.7 Speed control of induction motor by using converters and inverters (V/F control).	White board & marker
11	09/10/23 to 14/10/23	4.8 Working of UPS with block diagram. 4.9 Battery charger circuit using SCR with the help of a diagram. 4.10 Basic Switched mode power supply (SMPS) - explain its working & applications	White board & marker
12	16/10/23 to 20/10/23	5. PLC AND ITS APPLICATIONS 5.1 Introduction of Programmable Logic Controller(PLC) 5.2 Advantages of PLC	White board & marker & smart board



		5.3 Different parts of PLC by drawing the Block diagram and purpose of each part of PLC	
13	30/10/23 to 04/11/23	5.4 Applications of PLC 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	White board & marker
14	06/11/23 to 11/11/23	5.7 Ladder diagrams for i) AND gate ii) OR gate and iii) NOT gate. 5.8 Ladder diagrams for combination circuits using NAND, NOR, AND, OR and NOT 5.9 Timers-i) T ON ii) T OFF and iii) Retentive timer	White board & marker
15	13/11/23 to 18/11/23	5.10 Counters-CTU, CTD 5.11 Ladder diagrams using Timers and counters 5.12 PLC Instruction set	White board & marker & smart board
16	20/11/23 to 25/11/23	5.13 Ladder diagrams for following (i) DOL starter and STAR-DELTA starter (ii) Stair case lighting (iii) Traffic light Control (iv) Temperature Controller	White board & marker
17	28/11/23 to 30/11/23	5.14 Special control systems- Basics DCS & SCADA systems 5.15 Computer Control-Data Acquisition, Direct Digital Control System (Basics only)	White board & marker

Signature of HOD

Signature of faculty