

LESSON PLAN	
JHARSUGUDA ENGINEERING SCHOOL, JHARSUGUDA	
Name of the Faculty: Yasobanti Nayak	Academic Year: 2024-25
Course Code.: Th-5	Course name: Power Electronics & PLC
Programme: Diploma	Branch: E&TC
Year/ Sem:-3 rd /5 th	Section:

Sl. No.	Period	Time (min)	Unit	Topic to be Covered	Teaching Method
1.	1.	55 min	1	Introduction to power electronics	Black board
2.	2.	55min	1	Explain the operation, construction, V-I Characteristics & application of power diode	Black board
3.	3.	55min	1	Draw the layer diagram of SCR and explain the operation construction of SCR, Explain the two transistor analogy of SCR	Black board
4.	4.	55min	1	Explain the static V-I Characteristics & Dynamic characteristics of SCR	Black board
5.	5.	55min	1	Explain the Dynamic characteristics of SCR & application of SCR	Black board
6.	6.	55min	1	Explain the operation, construction of DIAC, draw V-I characteristics curve and list the applications of DIAC, Explain the operation, construction of TRIAC	Black board
7.	7.		1	Revision and assignment	Black board
8.	8.	55min	1	Describe the operation, construction of an NPN POWER Transistor as a switch & application of power BJT	Black board
9.	9.	55min	1	Explain the operation, construction of an Power MOSFET, GTO	Black board
10	10.	55min	1	Explain the operation, construction of IGBT	Black board
11	11.	55min	1	Gate characteristic of scr, Describe briefly different methods of TURN ON of an SCR	Black board
12	12.	55 min	1	Turn off methods of SCR(Load commutation, Resonant commutation)	Black board
13	13.	55 min	1	Revision and assignment	Black board
14	14.	55min	1	Voltage & current ratings of SCR, Protection of SCR	Black board
15	15.	55 min	1	Draw the general layout diagram of firing ckt & explain the same	Black board
16	16.	55 min	1	Draw R firing circuit, RC firing circuit and explain the same	Black board
17	17.	55min	1	Draw UJT pulse trigger circuit, explain synchronous triggering (Ramp Triggering)	Black board
18	18.	55min	1	Design of snubber circuit	Black board
19	19.	55 min	1	Assignment & Revision	Black board
20	20.	55 min	1	Class Test	Black board
21	21.	55 min	2	Introduction to Controlled rectifiers Techniques(Phase angle, Extinction angle)	Black board

22	22.	55 min	2	Working of single phase half wave controlled converter with resistive load & R-L Loads	Black board
23	23.	55 min	2	Working of single phase full wave controlled converter with resistive load & R-L Loads, Need of freewheeling diode	Black board
24	24.	55 min	2	Working of three phase half wave controlled converter with resistive load	Black board
25	25.	55 min	2	Working of three phase half wave controlled converter with resistive load	Black board
26	26.	55 min	2	Assignment & Revision	Black board
27	27.	55 min	2	Working of phase AC regulator	Black board
28	28.	55 min	2	Define chopper and its application, Explain the principle of operation of Step down chopper (Buck converts)	Black board
29	29.	55min	2	Explain the principle of operation of Step Up (Boost converts), Step up & Step down chopper (Buck Boost converts)	Black board
30	30.	55min	2	Define control strategies of chopper (TRC & Current unit), Explain the different types of chopper configuration	Black board
31	31.	55 min	2	Revision	Black board
32	32.	55 min	3	Define inverter & its classification & applications	Black board
33	33.	55 min	3	Explain the working of series & parallel inverter	Black board
34	34.	55 min	3	Explain Single phase half bridge voltage source inverter & explain its operation	Black board
35	35.		3	Explain Single phase full bridge inverter & explain its operation	Black board
36	36.	55 min	3	Define cycloconverter & its types, and advantage and disadvantage of cycloconverter	Black board
37	37.	55 min	3	Assignment & Revision	Black board
38	38.	55 min	3	Draw the diagram of a single phase to single phase cyclo-converter (step up and step down)with pure resistive load and draw its waveform, application of cyclo-converter	Black board
39	39.	55 min	3	Class test	Black board
40	40.	55 min	4	Assignment & Revision	Black board
41	41.	55 min	4	Applications of power electronic ckt	Black board
42	42.	55 min	4	List the factor affecting the speed of DC Motors	Black board
43	43.	55 min	4	Speed control for DC shunt motor using converter	Black board
44	44.	55 min	4	Speed control for DC shunt motor using chopper	Black board
45	45.	55 min	4	List the factors affecting the speed of AC Motors, Speed control for induction motor by using AC voltage regulator	Black board
46	46.	55 min	4	Speed control for induction motor by using Converters & inverters	Black board
47	47.	55 min	4	Working of UPS with block diagram	Black board
48	48.	55 min	4	Explain working of SMPS and its application	Black board
49	49.	55 min	4	Assignment & Revision	Black board
50	50.	55 min	5	Introduction, Advantage, application of PLC	Black board
51	51.	55 min	5	Explain the different parts and block diagram of plc	Black board

52	52.	55 min	5	Ladder diagram, Description of contact and coils(Normally open, Normally closed, Energized output, latched output	Black board
53	53.	55 min	5	Ladder diagram for AND,OR,NOT gate	Black board
54	54.	55 min	5	Ladder diagram for combinational ckts using NAND,NOR	Black board
55	55.	55 min	5	Timer-i)T ON ii) T OFF & iii) Rentative timer	Black board
56	56.	55 min	5	Counter-CTU,CTD	Black board
57	57.	55 min	5	Ladder diagrams using Timers & counters	Black board
58	58.	55 min	5	PLC instruction set	Black board
59	59.	55 min	5	Ladder diagram for DOL starter & star delta starter, stair case, traffic light control, temperature controller	Black board
60	60.	55 min	5	Basics of DCS,SCADA systems, data acquisition, direct digital control system	Black board
61	61.	55 min	5	Assignment & Revision	Black board
62	62.	55 min	5	Assignment & Revision	Black board
63	63.	55 min	5	Class test	Black board