

GOVERNMENT POLYTECHNIC NUAPADA

LESSON PLAN

DISCIPLINE : ELECTRICAL ENGG.		SEMESTER : 5TH SEM		NAME OF TEACHING FACULTY : ER. MUKESH KUMAR SAHU	
SUBJECT : TH-5: POWER ELECTRONICS AND PLC		NO. OF DAYS / PER WEEK CLASS ALLOTMENT: 4L/ WEEK		SEMESTER FROM Dt : 01/08/23 TO Dt: 30/11/23 NO OF WEEKS : 17	
MONTH/WEEK AUG, SEP, OCT, NOV	CLASS DAY	DATE	MODULE	THEORY / PRACTICAL TOPICS	Period Distributi on
1ST	01 02 03	01/08/23 02/08/23 04/08/23	1	UNDERSTAND THE CONSTRUCTION AND WORKING OF POWER ELECTRONICS DEVICES: 1.1 Introduction to Power Electronics circuits, construction, Operation, V-I characteristics & application of power diode, SCR, DIAC, TRIAC, Power MOSFET, GTO & IGBT 1.2 Two transistor model of SCR 1.3 Gate characteristics of SCR	18 Periods 5 1 1
2ND	04 05 06 07	07/08/23 08/08/23 09/08/23 11/08/23		1.4 switching char. Of SCR during Turn ON and turn OFF 1.5 turn ON method of SCR	2
3RD	08 09 10	14/08/23 16/08/23 18/08/23		1.6 turn OFF methods of SCR 1.6.1 Load commutation 1.6.2 Resonant pulse commutation	3
4TH	11 12 13 14	21/08/23 22/08/23 23/08/23 25/08/23		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	1 2
5TH	15 16 17	28/08/23 29/08/23 01/09/23		1.9 firing circuit 1.9.1 general layout diagram of firing circuit 1.9.2 R firing circuit 1.9.3 R-C firing circuit 1.9.4 UJT pulse triggering circuit 1.9.5 Synchronous triggering (Ramp triggering)	3
6TH	18 19 20 21	04/09/23 05/09/23 08/09/23 11/09/23		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 R load and RL load 2.3 Understand need of freewheeling diode	12 Periods 1 2 1
7TH	22 23 24	12/09/23 13/09/23 15/09/23		2.4 working of single-phase fully controlled converter with R load, RL load 2.5 working of three-phase half wave controlled converter with R load 2.6 working of three phase fully controlled converter with R load	2 1 1
8TH	25 26 27	18/09/23 22/09/23 25/09/23		2.7 working of single phase AC regulator 2.8 working principle of step-up and step-down converter 2.9 control modes of chopper 2.10 operation of chopper in all four quadrants	1 1 1 1
9TH	28 29 30	26/09/23 27/09/23 03/10/23		UNDERSTAND THE INVERTERS AND CYCLO-CONVERTERS 3.1 classify inverter 3.2 explain the working of series inverter 3.3 explain the working of parallel inverter	08 Periods 1 1 1
10TH	31 32 33	04/10/23 06/10/23 09/10/23		3.4 explain the working of single phase bridge inverter 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 application of cyclo-converter	1 1 2 1
11TH	34 35 36 37 38	10/10/23 11/10/23 13/10/23 16/10/23 17/10/23			

12TH	39	18/10/23	4	UNDERSTAND APPLICATION OF POWER ELECTRONICS CIRCUIT	10 periods
	40	20/10/23		4.1 list application of power electronics circuit	1
	41	30/10/23		4.2 List the factor affecting the speed of DC motors	1
13TH	42	31/10/23		4.3 speed control for DC shunt motor using converter	1
	43	01/11/23		4.4 speed control for DC shunt motor using chopper	1
	44	03/11/23		4.5 List of factors affecting speed of the AC motors	1
	45	06/11/23		4.6 speed control of induction motor by using AC voltage regulator	1
14TH	46	07/11/23		4.7 speed control of induction motor by using converters and inverter	2
	47	08/11/23		4.8 working of UPS with block diagram	1
	48	10/11/23		4.9 battery charger circuit using SCR with the help of diagram	1
				4.10 basic switched mode power supply (SMPS)- explain its working & applications	1
	49	13/11/23	5	PLC AND ITS APPLICATIONS	12 Periods
				5.1 introduction to Programmable Logic Controller (PLC)	1
	50	14/11/23		5.2 advantages of PLC	1
15TH	51	15/11/23		5.3 different parts of PLC by drawing the block diagram and purpose of each part of PLC	1
				5.4 application of PLC	
	52	17/11/23		5.5 ladder diagram	1
				5.6 description of contacts & coils in the following states	
				5.6.1 normally open	
				5.6.2 normally closed	
				5.6.3 energised output	1
				5.6.4 latched output	
				5.6.5 branching	
				5.7 ladder diagram	1
				5.7.1 AND gate	
				5.7.2 OR gate	
				5.7.3 NOT gate	
16TH	53	20/11/23		5.8 ladder diagram for combination circuit using NAND, NOR, AND, OR, NOT	1
				5.9 Timers	
				5.9.1 T-ON	1
				5.9.2 T-OFF	
				5.9.3 Retentive timer	
	54	21/11/23		5.10 counters- CTU, CTD	1
	55	22/11/23		5.11 Ladder diagrams using Timers and counters	
	56	24/11/23		5.12 PLC instruction set	2
				5.13 ladder diagram for following	
				5.13.1 DOL starter & STAR_DELTA starter	
				5.13.2 Stair case lighting	
				5.13.3 Traffic light control	
				5.13.4 temperature controller	
17TH	57	28/11/23		5.14 special control systems- Basic DCS & SCADA systems	1
	58	29/11/23		5.15 Computer control- Data Acquisition, Direct Digital control system (Basics only)	1

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31-07-23
AC
PRINCIPAL
GP NUAPADA