BALASORE SCHOOL OF ENGINEERING, BALASORE

LESSON PLAN/SEMESTER - 5TH (2023-WINTER)

- POWER ELECTRONICS AND PLC		THEORY- 05
ULTY- Mr. RANJIB KUMAR JENA		BRANCH-ELECTRICAL(SEC-B)

NO.	CH NO.	MONTH WISE NO.OF CLASS	DATE	TOPICS TO BE COVERED	NO.OF CLASSES AS PER SYLLABUS	NO.OF CLASSES AS PER LESSON PLAN
1	1	AUG	1/8/2023	Introduction to Power Electronics and PLC	18	17
				1. THYRISTOR		
2			2/8/2023	Construction,operation,V-I char. Of Power Diode		
3			5/8/2023	Construction,operation,V-I char. Of BJT		
4			8/8/2023	Construction,operation,V-I char. Of MOSFET		
5			9/8/2023	Construction,operation,V-I char. Of IGBT		
6			10/8/2023	Construction,operation,V-I char. Of DIAC AND TRIAC Construction,operation,V-I char. Of GTO		
7			12/8/2023	1.1 Principle of operation of SCR(Thyristor) Static V-I Characteristics of Thyristor		
8			16/8/23	1.2 Two transistor analogy of Thyristor		
9			17/8/23	1.3 Gate char. Of SCR		
10			19/8/23	1.4 Swaitching characterstics of Thyristor during turn on and turn off		
11			21/8/23	1.5 Turn on methods of Thyristor		
12			22/8/23	1.6 Turn off methods of SCR(Line and Forced commutation) 1.6.1 Load commutation 1.6.2 Resonant pulse commutation		
13			23/8/23	1.7 Voltzge and Current rating of Thyristor		
14			24/8/23	1.8 Protection of Thyristor 1.8.1 Over voltage protection		
15			26/8/23	1.8.2 Over current protection 1.8.3 Gate protection		
16			28/8/23	1.9. FIRING CIRCUITS FOR THYRISTER 1.9.1 General layout diagram of firing circuit Gate Triggering circuits ;		
17			29/8/23	1.9.2 Resistance firing		
18			31/8/23	1.9.3 Resistance capacitance firing.		
19			2/9/2023	1.9.4 UJT pulse trigger circuit 1.9.5 Synchroscope triggering(Ramp triggering)		
	2	SEPT		**2.PHASE CONTROLLED RECTIFIER (CONVERTER) (PRINCIPLE OF OPERATION WITH CKT DIAGRAM AND DC VOLTAGE AND D. C CURRENT EQUATION ONLY)**	12	10
20			4/9/2023	2.1 Controlled rectifier technique(Phase angle, Extintion angle)		
21			5/9/2023	Single quadrant semi converter, Two quadrant fully coverter		
22			7/9/2023	2.2 Single phase half wave converter with 2.3 Need of freewheeling diode		
23			9/9/2023	2.4 Single phase full wave converter with		
24			11/9/2023	2.5 Three phase half wave converter with 2.6 Three phase fully controlled		
25			12/9/2023	2.7 Single phase half wave and full wave A. C regulator.		
26			13/9/23	2.8 Principle of step down and step up		
27			14/9/23	2.9 Control modes of chopper		
28			16/9/23	2.10 Operetion of chopper in all four quadrants.		

				3.INVERTER and CYCLOCONVERTERS		
			21/9/23	3.1 Classify Inverter		
			23/9/23	3.2 Working of series inverter.		
			25/9/23	3.3 Working Parallel inverter		
32	3		26/9/23	3.4 Single phase Bridge Inverter	8	7
33			26/9/23	3.5 Principle of cycloconverter operation.		
34			27/9/23	3.6 Single phase to single phase circuit step		
35			28/9/23	Up and step down Cyclo converter.		
				3.7 Application of cycloconverter		
				4. A.C & D.C DRIVES		
36			30/9/23	4.1 List applications of power electronics circuit.		
				4.2 List the factors affecting the speed of dc motor		
37			3/10/2023	4.3 Speed control of dc shunt motor using converter		
38			4/10/2023	4.4 Speed control of dc shunt motor using chopper.		
39	4		5/10/2023	4.5List the factors affecting the speed of ac	10	8
40			7/10/2023	4.6 Speed control ofinduction motor using ac voltage regulator		
41			9/10/2023	4.7 Speed control of induction motor using converter and		
42			11/10/2023	4.8 Ups using block diagram		
		OCT		4.9 Battery charger using SCR		
43			12/10/2023	4.10 SMPS		
				5. PLC AND ITS APPLICATIONS		
44			30/10/23	5.1 Introduction of Programmable Logic Controller(PLC)		
				5.2 Advantages of PLC		
			31/10/23	5.3 Different parts of PLC by drawing the Block diagram		
45				and purpose of each part of PLC		
			1/11/2023	5.4 Applications of PLC		
46			2/11/2023	5.5 Ladder diagram		
				5.6 Description of contacts and coils in the following states		
			4/11/2023	i)Normally open ii) Normally closed iii) Energized output		
47				iv)latched Output v)branching		
			6/11/2023	5.7 Ladder diagrams for i) AND gate ii) OR gate and iii) NOT gate.		
48	5		7/11/2023	5.8 Ladder diagrams for combination circuits using NAND,	12	14
				NOR, AND, OR and NOT		
49		NOV	8/11/2023	5.9 Timers-i)T ON ii) T OFF and iii)Retentive timer		
			9/11/2023	5.10 Counters-CTU, CTD		
50				5.11 Ladder diagrams using Timers and counters		
51			13/11/2023	5.12 PLC Instruction set		
			14/11/2023	5.13 Ladder diagrams for following		
52				(i) DOL starter and STAR-DELTA starter (ii) Stair case lighting		
			15/11/2023	(iii) Traffic light Control		
53			16/11/2023	5.14 Special control systemBasic DCS and SCADA system		
			/11/2023	5.15 Computer control Data acquistion, Direct digital control system(basic only)		
					60	57

Month	Chapter	REMARKS
AUGUST	Ch-01 cont.	20%
SEPTEMBER	ch-01,ch-02 cont.	35%
OCTOBER	ch-02,ch-03,ch-04	30%
NOVEMBER	ch-05	15%

Lecturer 8/8/23

HOD 8/8/23

PRINCIPAL 8/8/23