BALASORE SCHOOL OF ENGINEERING, BALASORE

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

IB - POWER ELECTRONICS AND PLC				THEORY-05		
CULTY- Mr. RANJIB KUMAR JENA				BRANCH-ELECTRICAL(SEC-A)		
.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			1/8/2023	**Introduction to Power Electronics and PLC**		
				1. THYRISTOR		
2			2/8/2023	Construction,operation,V-I char. Of Power Diode		
3			4/8/2023	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			11/8/2023	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		AUG	18/8/23	1.4 Swaitching characterstics of Thyristor during turn on and turn off		
11	1		21/8/23	1.5 Turn on methods of Thyristor	18	17
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				1.8.2 Over current protection		
			25/8/23	1.8.3 Gate protection		
16			31/8/23	1.9. FIRING CIRCUITS FOR THYRISTER		
				1.9.1 General layout diagram of firing circuit Gate		
				Triggering circuits ;		
17			1/9/2023	1.9.2 Resistance firing		
18			4/9/2023	1.9.3 Resistance capacitance firing.		
19			5/9/2023	1.9.4 UJT pulse trigger circuit		
				1.9.5 Synchroscope triggering(Ramp triggering)		
				2.PHASE CONTROLLED RECTIFIER (CONVERTER) (PRINCIPLE OF OPERATION WITH CKT DIAGRAM AND DC VOLTAGE AND D. C CURRENT EQUATION ONLY)		
20			7/9/2023	2.1 Controlled rectifier technique(Phase angle, Extintion angle)		
21				Single quadrant semi converter, Two quadrant fully coverter		
22			8/9/2023	2.2 Single phase half wave converter with		
23	2		11/9/2023	2.3 Need of freewheeling diode		
24		SEPT	12/9/2023	2.4 Single phase full wave converter with	12	10
				2.5 Three phase half wave converter with		
25			13/9/23	2.6 Three phase fully controlled		
26			14/9/23	2.7 Single phase half wave and full wave A. C regulator.		
27				2.8 Principle of step down and step up		
28			15/9/23	2.9 Control modes of chopper		
			21/9/23	2.10 Operetion of chopper in all four quadrants.		

3				3.INVERTER and CYCLOCONVERTERS		
			22/9/23	3.1 Classify Inverter	8	7
			25/9/23	3.2 Working of series inverter.		
			26/9/23	3.3 Working Parallel inverter		
			27/9/23	3.4 Single phase Bridge Inverter		
			28/9/23	3.5 Principle of cycloconverter operation.		
			29/9/23	3.6 Single phase to single phase circuit step		
			3/10/2023	Up and step down Cyclo converter.		
				3.7 Application of cycloconverter		
4		OCT		4. A.C & D.C DRIVES		
			4/10/2023	4.1 List applications of power electronics circuit.	10	8
				4.2 List the factors affecting the speed of dc motor		
			5/10/2023	4.3 Speed control of dc shunt motor using converter		
			6/10/2023	4.4 Speed control of dc shunt motor using chopper.		
			9/10/2023	4.5List the factors affecting the speed of ac		
			10/10/2023	4.6 Speed control ofinduction motor using ac voltage regulator		
			11/10/2023	4.7 Speed control of induction motor using converter and		
			12/10/2023	4.8 Ups using block diagram		
				4.9 Battery charger using SCR		
			13/10/23	4.10 SMPS		
5		NOV		5. PLC AND ITS APPLICATIONS		
			30/10/23	5.1 Introduction of Programmable Logic Controller(PLC)	12	14
				5.2 Advantages of PLC		
			31/10/23	5.3 Different parts of PLC by drawing the Block diagram		
				and purpose of each part of PLC		
			1/11/2023	5.4 Applications of PLC		
				5.5 Ladder diagram		
			2/11/2023	5.6 Description of contacts and coils in the following states		
				i)Normally open ii) Normally closed iii) Energized output		
			3/11/2023	iv)latched Output v)branching		
			3/11/2023	5.7 Ladder diagrams for i) AND gate ii) OR gate and iii) NOT gate.		
			6/11/2023	5.8 Ladder diagrams for combination circuits using NAND,		
			7/11/2023	NOR, AND, OR and NOT		
			8/11/2023	5.9 Timers-i)T ON ii) T OFF and iii)Retentive timer		
			9/11/2023	5.10 Counters-CTU, CTD		
			10/11/2023	5.11 Ladder diagrams using Timers and counters		
			13/11/23	5.12 PLC Instruction set		
			14/11/23	5.13 Ladder diagrams for following		
			15/11/23	(i) DOL starter and STAR-DELTA starter (ii) Stair case lighting		
			16/11/23	(iii) Traffic light Control		
			17/11/23	5.14 Special control systemBasic DCS and SCADA system		
				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