



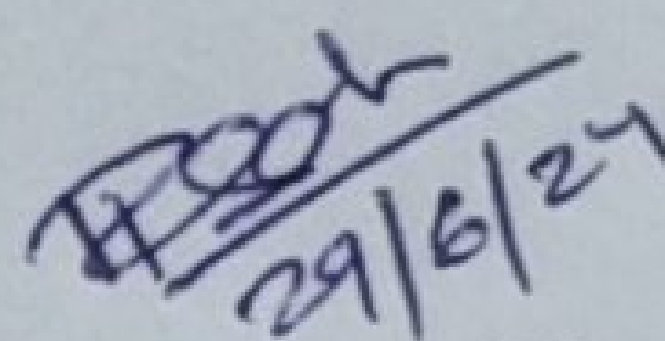
GIET POLYTECHNIC, JAGATPUR, CUTTACK

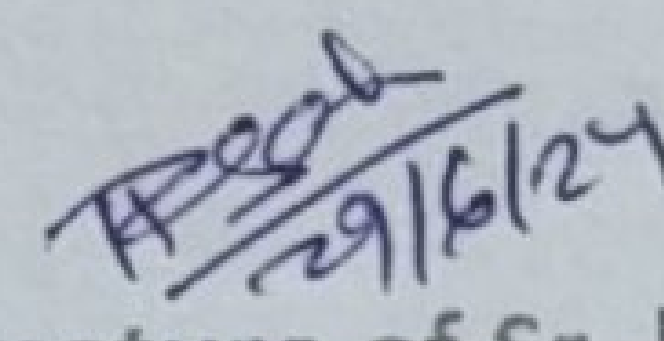
LESSON PLAN

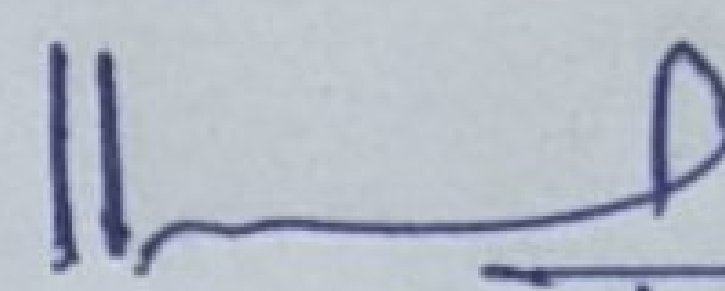
Discipline: E&TC ENGG.	Semester: 5 TH	Name Of The Teaching Faculty: RUPAK KUMAR SAOO	
Subject: POWER ELECTRONICS AND PLC (TH- 5)	No. Of Days Per Week Class Allotted: 04	Semester From Date: 01/07/2024	To Date: 08/11/2024
		No. of weeks: 15	
Week	Class Day	Theory Topic	
1 st week	1 st	<u>Unit-1: UNDERSTAND THE CONSTRUCTION & WORKING OF POWER ELECTRONIC DEVICES</u>	
	2 nd	➤ 1.1: Construction, operation, V-I characteristics & application of power diode, SCR, DIAC, TRIAC, power MOSFET, GTO & IGBT	
	3 rd	➤ 1.1: Construction, operation, V-I characteristics & application of power diode, SCR, DIAC, TRIAC, power MOSFET, GTO & IGBT (Continue....)	
	4 th	➤ 1.1: Construction, operation, V-I characteristics & application of power diode, SCR, DIAC, TRIAC, power MOSFET, GTO & IGBT (Continue....)	
2 nd week	1 st	➤ 1.2: Two transistor analogy of SCR ➤ 1.3: Gate characteristics of SCR	
	2 nd	➤ 1.4: Switching characteristics of SCR during turn on & turn off	
	3 rd	➤ 1.5: Turn on methods of SCR	
	4 th	➤ 1.6: Turn off methods of SCR (Line communication & Forced communication)	
3 rd week	1 st	➤ 1.6.1: Load communication ➤ 1.6.2: Resonant pulse communication	
	2 nd	➤ 1.7: Voltage and Current ratings of SCR ➤ 1.8: Protection of SCR	
	3 rd	➤ 1.8.1: Over voltage protection	
	4 th	➤ 1.8.2: Over current protection	
4 th week	1 st	➤ 1.8.3: Gate protection ➤ 1.9: Firing circuits	
	2 nd	➤ 1.9.1: General layout diagram of firing circuits	
	3 rd	➤ 1.9.2: R firing circuit ➤ 1.9.3: R-C firing circuits	

	4 th	➤ 1.9.4: UJT pulse trigger circuit
5 th week	1 st	➤ 1.9.5: synchronous triggering(Ramp triggering)
	2 nd	➤ 1.10: Design of snubber circuits
	3 rd	<p style="text-align: center;"><u>UNIT 2: UNDERSTAND THE WORKING OF CONVERTERS, AC REGULATORS AND CHOPPERS</u></p> ➤ 2.1: Controlled rectifiers techniques(Phase Angle, Extinction Angle Control),Single quadrant semi converter, two quadrant full converter and dual converter
	4 th	➤ 2.1: Controlled rectifiers techniques(Phase Angle, Extinction Angle Control),Single quadrant semi converter, two quadrant full converter and dual converter (continue.....)
6 th week	1 st	➤ 2.1: Controlled rectifiers techniques (Phase Angle, Extinction Angle Control),Single quadrant semi converter, two quadrant full converter and dual converter (continue.....)
	2 nd	➤ 2.2: Working of single phase half wave controlled converter with Resistive and R-L loads
	3 rd	➤ 2.3: Understand need of freewheeling diode
	4 th	➤ 2.4: Working of single phase fully controlled converter with Resistive and R-L loads
7 th week	1 st	➤ 2.5: working of three phase half wave controlled converter with Resistive load
	2 nd	➤ 2.6: Working of three phase fully controlled converter with resistive load
	3 rd	➤ 2.7: Working of single phase AC regulator
	4 th	➤ 2.8: Working principle of step up & step down chopper
8 th week	1 st	➤ 2.9: Control modes of chopper
	2 nd	➤ 2.10: Operation of chopper in all four quadrants
	3 rd	<p style="text-align: center;"><u>UNIT 3: UNDERSTAND THE INVERTERS AND CYCLO-CONVERTERS</u></p> ➤ 3.1: Classify inverters
	4 th	➤ 3.2: Explain the Working of series inverter
9 th week	1 st	➤ 3.3: Explain the Working of parallel inverter
	2 nd	➤ 3.4: Explain the Working of single phase bridge inverter
	3 rd	➤ 3.5: Explain the Basic principle of Cyclo-converter
	4 th	➤ 3.6: Explain the Working of single phase step up & step down Cyclo-converter
10 th week	1 st	➤ 3.6: Explain the Working of single phase step up & step down Cyclo-converter. (continue.....)
	2 nd	➤ 3.7: Applications of Cyclo-converter.
	3 rd	<p style="text-align: center;"><u>UNIT 4: UNDERSTAND APPLICATIONS OF POWER ELECTRONIC CIRCUITS</u></p> ➤ 4.1: List Applications of power electronic circuits

	4 th	➤ 4.2: List the factors affecting the speed of DC motors
11 th week	1 st	➤ 4.3: Speed control for DC shunt motor using converter
	2 nd	➤ 4.4: Speed control for DC shunt motor using chopper
	3 rd	➤ 4.5: List the factors affecting speed of the AC motors
	4 th	➤ 4.6: Speed control of induction motor by using AC voltage regulator
12 th week	1 st	➤ 4.7: Speed control of Induction motor by using converters and inverters(V/F control)
	2 nd	➤ 4.8: Working of UPS with block diagram
	3 rd	➤ 4.9: Battery charger circuit using SCR with the help of a diagram
	4 th	➤ 4.10: Basic Switched mode power supply(SMPS). Explain its Working & application
13 th week	1 st	<u>UNIT 5: PLC AND ITS APPLICATIONS</u> ➤ 5.1: Introduction of Programmable logic Controller (PLC) ➤ 5.2: Advantages of PLC
	2 nd	➤ 5.3: Different parts of PLC By drawing the Block diagram and purpose of each part of PLC
	3 rd	➤ 5.4: Applications of PLC ➤ 5.5: Ladder diagram
	4 th	➤ 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
14 th week	1 st	➤ 5.7: Ladder diagram for (i)AND gate(ii)OR gate and (iii)Not gate
	2 nd	➤ 5.8: Ladder diagrams for combination circuit using NAND, NOR, AND,OR & NOT
	3 rd	➤ 5.9: Timers (i)T ON(ii)T OFF and (III)Retentive timer
	4 th	➤ 5.10: Counters-CTU, CTD
15 th week	1 st	➤ 5.11: Ladder diagrams using Timers & counters ➤ 5.12: PLC instruction set
	2 nd	➤ 5.13: Ladder diagrams for following ➤ (i)DOL starter & STAR-DELTA starter(ii)Stair case lightning(iii)Traffic light control (iv)Temperature controller
	3 rd	➤ 5.14: Special control systems-Basics DCS & SCADA Systems
	4 th	➤ 5.15: computer control-Data Acquisition, Direct Digital Control System(Basics only)


29/6/24
Signature of faculty


29/6/24
Signature of Sr. Lecturer
Head of Dept. HOD
Electrical & ETC F
G. E.T (POLY),


29/6/24
Signature of principal