

LESSON PLAN

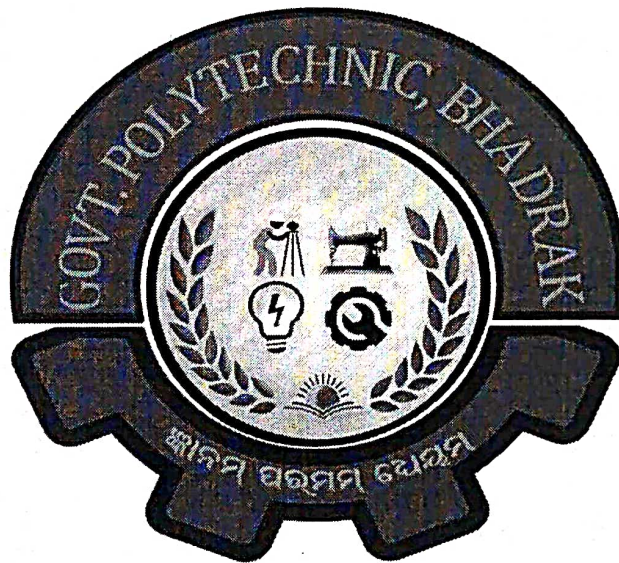


SUB:-POWER ELECTRONICS & PLC.

BRANCH:- ELECTRICAL ENGG.


SEMESTER: 5TH

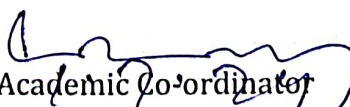
NAME OF FACULTY: - UMESH KUMAR DALAI

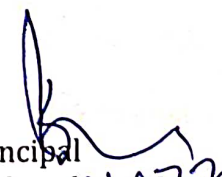


**GOVERNMENT POLYTECHNIC,
BHADRAK**

SESSION:2024-25


Hod Electrical
HOD (ELECT.)
G.P.BHADRAK


Academic Co-ordinator
Academic Co-ordinator


Principal
Govt. Polytechnic Bhadrak
Principal
Govt. Polytechnic
Bhadrak

Discipline: ELECTRICAL ENGG.	Semester: 5th	Name of the Teaching Faculty : UMESH KUMAR DALAI
Subject: POWER ELECTRONICS AND PLC	No. of Days/per week class allotted:4	Semester from date: 01.07.2024 to 08.11.2024 No. of Weeks:15
Week	Class Day	Theory
1st	1st	Construction, Operation, V-I characteristics & application of power Diode.
	2nd	Construction, Operation, V-I characteristics & application of SCR
	3rd	Construction, Operation, V-I characteristics & application of DIAC & TRIAC
	4th	Construction, Operation, V-I characteristics & application of Power MOSFET
2nd	1st	Construction, Operation, V-I characteristics & application of GTO & IGBT
	2nd	Two transistor analogy of SCR..
	3rd	Gate characteristics of SCR.
	4th	Switching characteristic of SCR during turn on and turn off.
3rd	1st	Turn on methods of SCR..
	2nd	Turn off methods of SCR (Line commutation and Forced commutation)
	3rd	Load Commutation Resonant pulse commutation
	4th	Voltage and Current ratings of SCR
4th	1st	Protection of SCR Over voltage protection
	2nd	Over current protection Gate protection
	3rd	Firing Circuits and General layout diagram of firing circuit 1.
	4th	R firing circuits and R-C firing circuit.
5th	1st	UJT pulse trigger circuit and Synchronous triggering (Ramp Triggering.
	2nd	Design of Snubber Circuits and chapter revision
	3rd	Controlled rectifiers Techniques(Phase Angle, Extinction Angle control),
	4th	Single quadrant semi converter, two quadrant full converter and dual Converter.
6th	1st	Working of single-phase half wave controlled converter with Resistive
	2nd	Working of single-phase half wave controlled converter with R-L loads and Understand need of freewheeling diode.

	3 rd	Working of three-phase half wave controlled converter with Resistive load
	4 th	Working of three-phase fully wave controlled converter with Resistive load
7 th	1 st	Working of single phase AC regulator
	2 nd	Working principle of step up chopper
	3 rd	Working principle of step down chopper
	4 th	Control modes of chopper
8 th	1 st	Operation of chopper in all four quadrants
	2 nd	Class test of ch-1 and ch-2
	3 rd	Classify inverters
	4 th	Explain the working of series inverter
9 th	1 st	Explain the working of parallel inverter
	2 nd	Explain the working of single-phase bridge inverter
	3 rd	Explain the basic principle of Cyclo-converter
	4 th	Explain the working of single-phase step up Cyclo-converter
10 th	1 st	Explain the working of single-phase step down Cyclo-converter
	2 nd	
	3 rd	List applications of power electronic circuits
	4 th	List the factors affecting the speed of DC Motors
11 th	1 st	Speed control for DC Shunt motor using converter
	2 nd	Speed control for DC Shunt motor using chopper
	3 rd	List the factors affecting speed of the AC Motors.
	4 th	Speed control of Induction Motor by using AC voltage regulator
12 th	1 st	Speed control of induction motor by using converters and inverters (V/F control)
	2 nd	Working of UPS with block diagram
	3 rd	Battery charger circuit using SCR with the help of a diagram.
	4 th	Basic Switched mode power supply (SMPS) - explain its working & applications
13 th	1 st	Introduction of Programmable Logic Controller(PLC) Advantages of PLC
	2 nd	Different parts of PLC by drawing the Block diagram and purpose of each part of PLC
	3 rd	Applications of PLC Ladder diagram
	4 th	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	1 st	Ladder diagrams for i) AND gate ii) OR gate and iii) NOT gate.

	2 nd	Ladder diagrams for combination circuits using NAND,NOR, AND, OR and NOT
	3 rd	Timers-i) T ON ii) T OFF and iii) Retentive timer
	4 th	Counters-CTU, CTD
15 th	1 st	Ladder diagrams using Timers and counters And PLC Instruction set
	2 nd	Ladder diagrams for following (i) DOL starter and STAR-DELTA starter (ii) Stair case lighting (iii) Traffic light Control (iv) Temperature Controller
	3 rd	Special control systems- Basics DCS & SCADA systems Computer Control-Data Acquisition, Direct Digital Control System (Basics only)
	4 th	Previous year question discussions

Vek
 01.07.2024
 Lect.in Elect.Engg.
 Govt.Poly.Bhadrak