



GOVERNMENT POLYTECHNIC, BALASORE

Government of Odisha


ସରକାରୀ ବହୁବୃତ୍ତି ଅନୁଷ୍ଠାନ, ବାଲେଶ୍ଵର


LESSON PLAN (WINTER-2025)

Discipline: ELECTRONICS & TELECOMMUNICATION ENGINEERING	Semester: 5 th	Name of the Teaching Faculty: PRAKASH CHANDRA DAS
Subject: POWER ELECTRONICS & PLC	No of Days /per week class allotted: 4	Semester From date: 14 TH JULY, 2025 No of Weeks:15
Week	Class Day	Theory Topics
1st	1st	Construction, Operation, V-I characteristics & application of power diode, DIAC
	2nd	Construction, Operation, V-I characteristics & application of SCR, Two transistor analogy of SCR
	3rd	Construction, Operation, V-I characteristics & application of TRIAC, GTO
	4th	Construction, Operation, V-I characteristics & application of power MOSFET
2nd	1st	Construction, Operation, V-I characteristics & application of IGBT.
	2nd	Gate characteristics of SCR.
	3rd	Switching characteristic of SCR during turn on and turn off
	4th	Turn on methods of SCR.
3rd	1st	Turn off methods of SCR, Line commutation
	2nd	Turn off methods of SCR, Forced commutation- Load Commutation
	3rd	Turn off methods of SCR, Forced commutation- Resonant pulse commutation
	4th	Voltage and Current ratings of SCR.
4th	1st	Protection of SCR -(1) Over voltage protection (.2)Over current protection
	2nd	Protection of SCR-(.3) Gate protection
	3rd	Firing Circuits -General layout diagram of firing circuit
	4th	R firing circuits , R-C firing circuit

5th	1st	UJT pulse trigger circuit
	2nd	Synchronous triggering , Design of Snubber Circuits g (Ramp Triggering)
	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 and R-L loads
	2nd	Understand need of freewheeling diode. Working of single phase fully controlled converter with resistive and R- L loads.
	3rd	Working of three-phase half wave controlled converter with Resistive load
	4th	Working of three phase fully controlled converter with resistive load.
7th	1st	Working of single phase AC regulator
	2nd	Working principle of step up chopper.
	3rd	Working principle of step down chopper.
	4th	Control modes of chopper
8th	1st	Operation of chopper in 1 st and 3 rd quadrants.
	2nd	Operation of chopper in 2 nd & 4 th quadrants.
	3rd	Classify inverters.
	4th	Explain the working of series inverter.
9th	1st	Explain the working of parallel inverter
	2nd	Explain the working of single-phase bridge inverter.
	3rd	Explain the basic principle of Cyclo converter.
	4th	Explain the working of single-phase step up
10th	1st	Explain the working of single-phase step down Cyclo-converter.
	2nd	Applications of Cyclo-converter.
	3rd	List applications of power electronic circuits.
	4th	List the factors affecting the speed of DC Motors.
11th	1st	Speed control for DC Shunt motor using converter
	2nd	Speed control for DC Shunt motor using chopper

	3rd	List the factors affecting speed of the AC Motors.
	4th	Speed control of Induction Motor by using AC voltage regulator.
	1st	Speed control of induction motor by using converters and inverters (V/F control)
	2nd	Working of UPS with block diagram.
12th	3rd	Battery charger circuit using SCR with the help of a diagram.
	4th	Basic Switched mode power supply (SMPS) - explain its working & applications
	1st	Introduction of Programmable Logic Controller(PLC), Advantages of PLC Applications of PLC Ladder diagram
	2nd	Different parts of PLC by drawing Block diagram & purpose of each part of PLC
13th	3rd	Description of contacts and coils in the following states i) Normally open ii) Normally closed iii) Energized output iv) latched Output v) branching
	4th	Ladder diagrams using Timers
	1st	Ladder diagrams using counters
	2nd	PLC Instruction set
14th	3rd	Ladder diagrams for DOL starter (ii) Stair case lighting
	4th	Ladder diagrams for STAR-DELTA starter
	1st	Ladder diagrams for Traffic light Control
	2nd	Ladder diagrams for Temperature Controller
15th	3rd	Special control systems- Basics DCS & SCADA systems
	4th	Computer Control–Data Acquisition, Direct Digital Control System (Basics only)


 Faculty 9/9/2025


 HOD 09/09/25