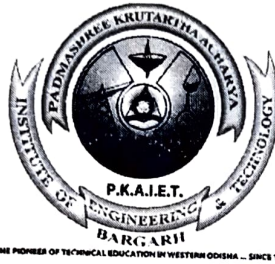


# PADMASHREE KRUTARTHA ACHARYA INSTITUTE OF ENGINEERING & TECHNOLOGY, BARGARH



## LESSON PLAN Session-2023-2024

Discipline: Electrical Engg. Semester: 5th

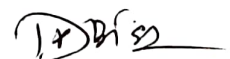
Subject: Power Electronics and PLC

Name of the Teaching Faculty: Durga prasad Biswal

Subject: Power Electronics and PLC No. of Days/per week class allotted 4

Semester From Date: 01/08/2023 To Date: 30/11/2023 No. of Weeks: 15

Week	Class Day	Theory/Practical Topics
1	1	Construction, operation, V-I Char. of power diode, SCR construction, symbol and application
	2	Two transistor analogy of SCR
	3	Turn-on methods of SCR, V-I char. of SCR
	4	Dynamic char. of SCR
2	5	Commutation of SCR - (i) Line commutation (ii) Load commutation
	6	Resonant pulse commutation
	7	Gate char. of SCR
	8	Voltage and current rating of SCR
3	9	Protection of SCR, $\frac{di}{dt}$ protection, $\frac{dv}{dt}$ protection, overvoltage protection
	10	Over current protection
	11	Gate protection
	12	Firing ckt - general layout of firing circuit

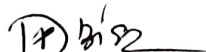


Signature of the Faculty

Subject: Power Electronics and PLC No. of Days/per week class allotted 4

Semester From Date: 1/8/2023 To Date: 30/11/2023 No. of Weeks: 15

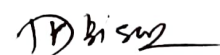
Week	Class Day	Theory /Practical Topics
4	13	R- firing circuit
	14	R-C firing circuit (Half and Full wave R C firing circuit)
	15	UJT triggering circuit
	16	Ramp triggering
5	17	Design of snubber circuit
	18	Numerical problems on snubber circuit
	19	construction, operation, V-I char. of DIAC, TRIAC
	20	construction, operation, V-I char. of MOSFET, IGBT
6	21	controlled Rectifier Techniques
	22	working of 1 $\phi$ half-wave converter with R and R-L load
	23	working of 1 $\phi$ half-wave converter with R-L load and fd.
	24	working of 1 $\phi$ Fully controlled converter with R and R-L load (Bridge Converter)

  
Signature of the Faculty

Subject: Power Electronics and PLC No. of Days/per week class allotted 4

Semester From Date: 1/08/2023 To Date: 30/11/2023 No. of Weeks: 15

Week	Class Day	Theory / Practical Topics
7	25	Working of 1 $\phi$ Fully controlled converter with R and R-L load (midpoint converter)
	26	Working of 3 $\phi$ half-wave converter with R-load
	27	Working of 3 $\phi$ Fully controlled converter with R-load
	28	Working of 1 $\phi$ AC voltage regulator, application
8	29	Working principles of Step-up and Step-down Chopper
	30	Control modes of Chopper, Application of Chopper
	31	Operation of Chopper in all four quadrants
	32	Classification of inverter, Explain working of 1 $\phi$ bridge inverter, Application of inverter
9	33	Explain the working of Series inverter
	34	Explain the working of Parallel inverter
	35	Explain the basic principles of cycloconverter, working of Step-up and Step-down cycloconverter
	36	List out the application of power Electronics circuit

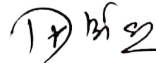


Signature of the Faculty

Subject: Power Electronics and PLC No. of Days/per week class allotted 4

Semester From Date : 1/08/2023 To Date : 30/11/2023 No. of Weeks : 15


Week	Class Day	Theory / Practical Topics
10	37	List the factors affecting the speed of DC motor
	38	speed control of D.C. Shunt motor using converter
	39	speed control of DC shunt motor by using chopper
	40	List the factor affecting the speed of AC motor
11	41	speed control of AC motor using AC voltage Controller
	42	speed control of I.M. by using converter and inverter
	43	working of UPS with block Diagram
	44	Battery charger circuit using SCR
12	45	SMPS - Its working principles, classification and application
	46	Introduction to PLC, advantage of PLC
	47	Different parts of PLC
	48	Application of PLC, Ladder Diagram

  
Signature of the Faculty

Subject: Power Electronics and PLC No. of Days/per week class allotted 4

Semester From Date: 1/08/2023 To Date: 30/11/2023 No. of Weeks: 15

Week	Class Day	Theory / Practical Topics
13	49	Description of Contact and coil - (i) NO (ii) NC (iii) Energized o/p (iv) Latched output (v) Branching
	50	Ladder diagram for - (i) AND (ii) OR (iii) NOT and all other gates.
	51	Timer circuit, CTV, CTD, Counter
	52	Ladder diagram using timer
14	53	Ladder diagram using counter
	54	PLC instruction set
	55	Ladder diagram for DOL starter
	56	Ladder diagram for Y-Δ starter
15	57	Ladder diagram for Traffic light
	58	Ladder diagram for Temperature control
	59	Special control using DCS and SCADA
	60	Computer control data, Direct digital control

  
Signature of the Faculty