



**JEYPORESCHOOL OF ENGINEERING AND TECHNOLOGY, RANDAPALLI**  
**DEPARTMENT OF ELECTRICAL ENGINEERING**

**LESSON PLAN FOR YEAR:-2025-26 SUB:- TH-1(FUNDAMENTAL OF POWER ELECTRONICS)**

**DISCIPLINE: ELECTRICAL ENGINEERING**

**SEM:- 4TH**

**NAME OF THE FACULTY:- MR.SATYABRATA DAKUA**

**SUBJECT:- PE**

**NO.OF DAYS/PER WEEK CLASS ALLOTTED: 3**

**SEMESTER FROM DATE:22/12/2025 TO DATE:-18/04/2026 NO.OFWEEK:- 15**

**COURSE OUTCOMES**

- CO1:-.How to select power electronics device for specific application.
- CO2:-To maintain the performance of Thyristors.
- CO3:-.To troubleshoot turn-on and turn-off circuits of Thyristors.
- CO4:-To maintain phase controlled circuits.
- CO5:- To maintain industrial control circuits.

WEEK	CLASSDAY	THEORY TOPICS
1st	1st	<b>(I)Power Electronic Devices</b>
	2nd	Power transistor construction and working principle
	3rd	V-I characteristics and uses of Power transistor
2nd	1st	IGBT construction and working principle
	2nd	V-I characteristics and uses of IGBT
	3rd	Concept of single electron transistor (SET)
3rd	1st	Aspects of Nano- technology
	2nd	<b>(II) Thyristor Family Devices SCR Construction of SCR</b>
	3rd	Two transistor analogy of SCR
4th	1st	Types, working and characteristics SCR
	2nd	SCR mounting and cooling
	3rd	Types of Thyristors: SCR, LASCR, SCS, GTO, UJT, PUT, DIAC and TRIAC
5th	1st	Thyristor family devices
	2nd	Symbol and construction of Thyristor s Devices
	3rd	Operating principle Thyristors Devices

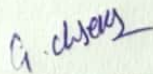


6th	1st	V-I characteristics Thyristor s Devices
	2nd	Protection circuits Over-voltage Over-current
	3rd	Protection circuits Snubber Crowbar
		<b>(III)SCR Turn-On methods</b>
7th	1st	High Voltage thermal triggering,
	2nd	Illumination triggering
	3rd	dv/dt triggering
8th	1st	Gate triggering
	2nd	Gate trigger circuits
	3rd	Resistance and Resistance-Capacitance circuits
9th	1st	SCR triggering using UJT
	2nd	PUT: Relaxation Oscillator and Synchronized UJT circuit
	3rd	SCR Turn
10th	1st	Class A - Series resonant commutation circuit
	2nd	Class B-Shunt Resonant commutation circuit
	3rd	Class C-Complimentary Symmetry commutation circuit
11th	1st	Class D-Auxiliary commutation
	2nd	Class E-External pulse commutation
	3rd	Class F-Line or natural commutation
12th	1st	<b>(IV)Phase Controlled Rectifiers Phase control: firing angle, conduction angle</b>
	2nd	Single phase half controlled rectifier with R, RL load
	3rd	full controlled and midpoint-controlled rectifier with R, RL load
13th	1st	Circuit diagram, working, input- output waveforms freewheeling diode
	2nd	equations for DC output and effect of freewheeling diode
	3rd	Different configurations of bridge controlled rectifiers: Full bridge, half bridge with common anode,

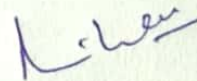
14th	1st	common cathode SCRs in one arm and diodes in another arm
	2nd	(v)Industrial Control Circuits Applications: Burglar's alarm system, Battery charger using SCR
	3rd	Emergency light system, Temperature controller using SCR
15th	1st	Illumination control/fan speed control TRIAC
	2nd	SMPS
	3rd	UPS: Offline and Online, SCR based AC and DC circuit breakers.
Learning Source	1.An Introduction to Thyristors and their application by M.Ramamoorthy, East-West Press Pvt. 2.Thyristors:Theory and application by Rajendra Kumar SugandhiKrishna Kumar Sugandhi, New Age International (P) Ltd. 3.Fundamental of Power Electronics by S.K Bhattacharya,Vikas Publishing HousePvt.Ltd. 4.Power Electronics and Application by Alok Jain,Penram International publisher(India)Pvt.Ltd 5.Industrial Electronics by Paul B. Zbar, Mcgraw Hill Publishers 6.E-learning Notes from <a href="http://sctevt.odisha.gov.in">http://sctevt.odisha.gov.in</a>	



Signature of Faculty



Signature of HOD



Signature of the Principal  
**PRINCIPAL**

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