

**GOVT POLYTECHNIC,GAJAPATI**  
**Department Of Electrical Engineering**

**LESSON PLAN**

Subject : TH:1- FUNDAMENTALS OF POWER ELECTRONICS

Name of Faculty: Sri Deepak Ku Roul,Lect(S-2)

Semester : 4<sup>th</sup>

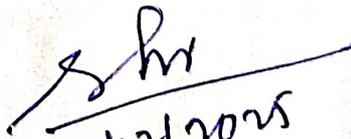
Branch : Electrical Engineering

No of period: 45 (3hr /week)

W.E.F :- 22.12.2025

Week	Period	Topic to be covered	Teaching Aid to be use
1		<b>Power Electronic Devices</b>	
	1	construction and working principle of Power Transistor	White board ,Marker, Ref book, notes
	2	V-I characteristics and uses	-do-
	3	Construction and working principle of IGBT	-do-
2	4	V-I characteristics and uses	-do-
	5	Concept of single electron transistor (SET)	-do-
	6	Aspects of Nano- technology(concept only)	-do-
3		<b>Thyristor Family Devices</b>	
	7	Construction of SCR	-do-
	8	Two transistor analogy of SCR	
	9	Types, working and characteristics	White board ,Marker, Ref book, notes
4	10	SCR mounting and cooling	-do-
	11	Types of Thyristors: SCR, LASCR, SCS, GTO,	-do-
	12	UJT, PUT	-do-
5	13	DIAC and TRIAC	-do-
	14	Thyristor family devices symbol & Construction	-do-
	15	Operating principle & V-I characteristics	-do-
6	16	Protection circuits	-do-
		<b>Turn-on and Turn-off Methods of Thyristors</b>	
	17	SCR Turn ON methods	-do-
	18	Gate trigger circuits, Resistance and Resistance-Capacitance circuits	-do-
7	19	SCR triggering using UJT	-do-
	20	PUT: Relaxation Oscillator and Synchronized UJT circuit	White board ,Marker, Ref book, notes
	21	Pulse transformer and opto-coupler based triggering.	-do-
8	22	Class A- Series resonant commutation circuit Class B-Shunt Resonant commutation circuit	-do-
	23	Class C-Complimentary Symmetry commutation circuit Class D-Auxiliary commutation	-do-
	24	Class E-External pulse commutation Class F-Line or natural commutation	-do-

Week	Period	Topic to be covered	Teaching Aid to be use
9		<b>Phase Controlled Rectifiers</b>	White board ,Marker, Ref book, notes
	25	Phase control: firing angle, conduction angle.	-do-
	26	Single phase <b>half controlled</b> rectifier with R, RL load	-do-
	27	Single phase full controlled rectifier. Circuit diagram, working, input- output waveforms, equations for DC output and effect of freewheeling diode	-do-
10	28	Single phase <b>full controlled</b> and midpoint controlled rectifier .Circuit diagram, working, input- output waveforms, equations for DC output and effect of freewheeling diode	-do-
	29	Single phase <b>midpoint controlled</b> rectifier Circuit diagram, working, input- output waveforms, equations for DC output and effect of freewheeling diode	White board ,Marker, Ref book, notes
	30	Different configurations of bridge controlled rectifiers: Full bridge, half bridge with common anode, common cathode, SCRs in one arm and diodes in another arm	-do-
11	31	Different configurations of bridge controlled rectifiers: Full bridge, half bridge with common anode, common cathode, SCRs in one arm and diodes in another arm	-do-
		<b>Industrial Control Circuits</b>	-do-
	32	Applications: Burglar's alarm system,	White board ,Marker, Ref book, calculator
	33	Battery charger using SCR,	
12	34	Emergency light system	White board ,Marker,
	35	Temperature controller using SCR and; Illumination control/fan speed control TRIAC	White board ,Marker,
	36	SMPS	White board ,Marker, ,ref books ,Calculator
13	37	UPS: Offline and Online	
	38	SCR based AC and DC circuit breakers	-do-
	39	Revision of Ch-1	-do-
14	40	Revision of Ch-2	-do-
	41	Revision of Ch-3	
	42	Revision of Ch-4	White board ,Marker
15	43	Revision of Ch-5	
	44	Privious Year question Discussion	White board ,Marker, Ref book, notes
	45	Privious Year question Discussion	-do-

  
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