



**BIJU PATTANAİK INSTITUTE OF TECHNOLOGY**  
**GOVERNMENT POLYTECHNIC, PURI**  
ସରକାରୀ ବହୁବୃତ୍ତି ଅନୁଷ୍ଠାନ, ପୁରୀ

# **LESSON PLAN**

**ON**

**POWER ELECTRONICS & P.L.C**

**5<sup>TH</sup> SEMESTER**

***PREPARED BY***

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# LESSON PLAN OF POWER ELECTRONICS AND PLC

DISCIPLINE – ELECTRICAL ENGINEERING		Subject- P.E & P.L.C	5 <sup>TH</sup> SEMESTER( 2022-23) 15.09.2022-22.12.2022	FACULTY- LECT. AUROBINDO GHOSE (Lecturer in Electrical Engineering, G. P Puri.)
Semester Course Duration- 14 Weeks		No. of weeks-14 and No. of classes allotted per week:-4.		
Week	Lecture days	MODULE /TOPIC	Topics to be covered as per syllabus of SCTEVT.	LEARNING RESOURCES PRESCRIBED BY SCTEVT.
1st	1 <sup>st</sup>	1	Construction, operation, V-I characteristics & application of SCR, DIAC, TRIAC, POWER MOSFET, GTO & IGBT.	1. Power Electronics by Dr. P.S Bhimbira.
	2 <sup>nd</sup>	1	Two Transistor analogy of SCR	
	3 <sup>rd</sup>	1	Gate characteristics of SCR	
	4 <sup>th</sup>	1	Turn on methods of SCR	
2nd	1 <sup>st</sup>	1	Turn off methods of SCR	2. Modern Power Electronics by B.K Bose.
	2 <sup>nd</sup>	1	Voltage and Current ratings of SCR	
	3 <sup>rd</sup>	1	Protection of SCR	
	4 <sup>th</sup>	1	R & R-C firing circuits	
3rd	1 <sup>st</sup>	1	UJT and Ramp triggering	3. Power Electronics by M. D. Singh and K.B Khanchandani
	2 <sup>nd</sup>	1	Design of snubber circuits	
	3 <sup>rd</sup>	2	Phase angle, extinction angle and overview of basics of rectification	
	4 <sup>th</sup>	2	Working of 1-phase controlled half wave rectifier(R & R-L-load)	
4th	1 <sup>st</sup>	2	Working of 1-phase controlled full wave rectifier(R & R-L-load)	4. Power Electronics- M H Rashid
	2 <sup>nd</sup>	2	Understanding the need of free-wheeling diode.	
	3 <sup>rd</sup>	2	Working of 3-phase controlled half wave rectifier(R & R-L-load)	
	4 <sup>th</sup>	2	Working of 3-phase controlled full wave rectifier(R & R-L-load)	
5th	1 <sup>st</sup>	2	Working of single phase A.C regulator	
	2 <sup>nd</sup>	2	Working principle of step-up and step-down choppers.	
	3 <sup>rd</sup>	2	Control modes of choppers	
	4 <sup>th</sup>	2	Operation of chopper in all four quadrants	
6th	1 <sup>st</sup>	3	Classification of inverters and working of series inverter	
	2 <sup>nd</sup>	3	Working of 1-phase parallel inverter	
	3 <sup>rd</sup>	3	Working of 1-phase Bridge inverter	
	4 <sup>th</sup>	3	Explanation of basic principle of cyclo-converter and working of step-down cyclo-converter	
7th	1 <sup>st</sup>	3	Working of step-up cyclo-converter and applications of cyclo-converter	
	2 <sup>nd</sup>	4	Applications of power electronics circuits in speed control of DC motors	
	3 <sup>rd</sup>	4	Speed control of DC shunt motor using	



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			converters ( Half-wave and Full wave)	5. Power Electronics- P C Sen
	4 <sup>th</sup>	4	Speed control of DC shunt motor using choppers	
8th	1 <sup>st</sup>	4	Applications of power electronics circuits in speed control of AC motors	6. Power Electronics- N.Mohan
	2 <sup>nd</sup>	4	Speed control of Induction motor using AC voltage regulators	
	3 <sup>rd</sup>	4	Speed control of Induction motor using converters and inverters	
	4 <sup>th</sup>	4	Battery charger circuit using SCR	
9th	1 <sup>st</sup>	4	S.M.P.S – Working and Applications.	
	2 <sup>nd</sup>	5	Introduction to Programmable Logic Control and its Applications	
	3 <sup>rd</sup>	5	Advantages of PLC and Block diagram of PLC with component wise explanation	
	4 <sup>th</sup>	5	Ladder diagrams	
10th	1 <sup>st</sup>	5	Description of contacts-Normally open and Normally closed	
	2 <sup>nd</sup>	5	Ladder diagrams of combinational circuits	
	3 <sup>rd</sup>	5	Timers-On, Off and Retentive	
	4 <sup>th</sup>	5	Counters-CTU & CTD	
11th	1 <sup>st</sup>	5	Ladder diagrams using timers and counters	
	2 <sup>nd</sup>	5	PLC instruction sets	
	3 <sup>rd</sup>	5	Ladder diagrams of starters (DOL)	
	4 <sup>th</sup>	5	Ladder diagrams of starters (star-delta)	
12th	1 <sup>st</sup>	5	Ladder diagrams of stair-case lighting	7.Programmable logic Controllers by Frank D. Petruzela
	2 <sup>nd</sup>	5	Ladder diagrams of temperature controller	
	3 <sup>rd</sup>	5	Special control systems- Basics DCS & SCADA systems	
	4 <sup>th</sup>	5	Computer Control- Data acquisition	
13th	1 <sup>st</sup>	5	Basics of Direct Digital Control Systems	8.Programmable logic controller — Dr.M.Mitra &Dr.S.Sengupta
	2 <sup>nd</sup>	1	Revision	
	3 <sup>rd</sup>	2	Revision	
	4 <sup>th</sup>	3	Revision	
14th	1 <sup>st</sup>	4	Revision	
	2 <sup>nd</sup>	5	Revision	
	3 <sup>rd</sup>	1	Revision	
	4 <sup>th</sup>	2	Revision	

Signature of Faculty

Signature of H.O.D

Signature of Principal

