

**SUDDHANADA ENGINEERING AND RESEARCH
CENTRE LESSON PLAN**

Discipline :	Semester: 5th	Name of the Teaching Faculty : B. Krishna Priya
Subject :	POWER ELECTRONICS AND PLC.	
No. of Days / per week class allotted :		
04		
UNIT	TOPICS	No. of periods required
UNIT-1	UNDERSTAND THE CONSTRUCTION AND WORKING OF POWER ELECTRONIC DEVICES	1
	Construction, Operation, V-I characteristics & application of power diode.	1
	SCR, DIAC,	1
	TRIAC, Power MOSFET	1
	GTO & IGBT	1
	Two transistor analogy of SCR.	1
	Gate characteristics of SCR.	1
	Switching characteristic of SCR during turn on and turn off.	1
	Turn on methods of SCR.	1
	Turn off methods of SCR (Line commutation and Forced commutation)	1
	Voltage and Current ratings of SCR.	1
	Protection of SCR 1.8.1 Over voltage protection	1
	Over current protection 1.8.3 Gate protection	1
	Firing Circuits 1.9.1 General layout diagram of firing circuit 1.9.2 R firing circuits	1
	R-C firing circuit 1.9.4 UJT pulse trigger circuit	1
	Synchronous triggering (Ramp Triggering)	1
	Design of Snubber Circuits.	1
UNIT-2	UNDERSTAND THE WORKING OF CONVERTERS, AC REGULATORS AND CHOPPERS.	
	Controlled rectifiers Techniques(Phase Angle, Extinction Angle control)	1
	Single quadrant semi converter, two quadrant full converter and dual Converter	1
	Working of single-phase half wave controlled converter with Resistive and R-L loads.	1
	Understand need of freewheeling diode	1
	Working of single phase fully controlled converter with resistive and R- L loads	1
	Working of three-phase half wave controlled converter with Resistive load	1
	Working of three phase fully controlled converter with resistive load	1
	Working of single phase AC regulator	1
	CLASS TEST-1	1
	Working principle of step up & step down chopper.	1

	Control modes of chopper. Operation of chopper in all four quadrants	1
UNIT-3	UNDERSTAND THE INVERTERS AND CYCLO-CONVERTERS	
	Classify inverters.Explain the working of series inverter.	1
	Explain the working of parallel inverter.	1
	Explain the working of single-phase bridge inverter.	1
	Explain the basic principle of Cyclo-converter	1
	Explain the working of single-phase step up & step down Cyclo-converter	1
	Applications of Cyclo-converter.	1
UNIT-4	UNDERSTAND APPLICATIONS OF POWER ELECTRONIC CIRCUITS	
	List applications of power electronic circuits	1
	List the factors affecting the speed of DC Motors.	1
	Speed control for DC Shunt motor using converter.	1
	Speed control for DC Shunt motor using chopper.	1
	List the factors affecting speed of the AC Motors	1
	Speed control of Induction Motor by using AC voltage regulator	1
	Speed control of induction motor by using converters and inverters (V/F control)	1
	Working of UPS with block diagram	1
	Battery charger circuit using SCR with the help of a diagram	1
	INTERNAL ASSESMENT	1
	Basic Switched mode power supply (SMPS) - explain its working & applications	1
UNIT-5	PLC AND ITS APPLICATIONS	
	Introduction of Programmable Logic Controller(PLC)	1
	Advantages of PLC.	1
	Different parts of PLC by drawing the Block diagram and purpose of each part of PLC	1
	Applications of PLC. Ladder diagram	1
	Description of contacts and coils in the following states i)Normally open ii) Normally closed	1
	Description of contacts and coils in the following states iii) Energized output iv)latched Output v) branching	1
	Ladder diagrams for i) AND gate ii) OR gate and iii) NOT gateRevision	1
	Ladder diagrams for combination circuits using NAND,NOR	1
	Ladder diagrams for combination circuits using AND, OR and NOT	1
	Timers-i)T ON ii) T OFF and iii)Retentive timer	1
	Counters-CTU, CTD	1
	Ladder diagrams using Timers and counter. PLC Instruction set	1
	Ladder diagrams for following (i) DOL starter and STAR-DELTA starter	1
	Ladder diagrams for following (ii) Stair case lighting	1
	Ladder diagrams for following (iii) Traffic light Control	1

	Ladder diagrams for following (iv) Temperature Controller	1
	Special control systems- Basics DCS & SCADA systems	1
	Computer Control–Data Acquisition, Direct Digital Control System (Basics only)	1
	REVISION	1
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	CLASS TEST-2	1

