LESSON PLAN

Name of the Institute:	C. V. RAMAN POLYTECHNIC
Department:	ELECTRICAL ENGINEERING
Semester/Division/Branch:	5th SEM/EE
Subject Name with code:	POWER ELECTRONICS & PLC (TH-5)
Total No. of Class (Required):	60
Faculty Name:	SAUBHAGYA RANJAN BEHERA

Class No.	*Brief description of the Topic/Chapter to be taught*	Remarks
1	Construction, Operation, V-I characteristics & application of power diode, SCR,DIAC,TRIAC, Power MOSFET,GTO &IGBT	
2	Construction, Operation, V-I characteristics & application of power diode, SCR,DIAC,TRIAC, Power MOSFET,GTO &IGBT	
3	Two transistor analogy of SCR.	
4	Gate characteristics of SCR.	
5	Switching characteristic of SCR during turn on and turn off.	
6	Turn on methods of SCR.	
7	Turn on methods of SCR.	
8	Load Commutation	
9	Resonant pulse commutation	
10	Voltage and Current ratings of SCR.	
11	Over voltage protection	
12	Over current protection	
13	Gate protection	
14	General layout diagram of firing circuit	
15	R firing circuits	
16	R-C firing circuit	
17	UJT pulse trigger circuit	

18	Synchronous triggering (Ramp Triggering)	
19	Design of Snubber Circuits	
20	Controlled rectifiers Techniques(Phase Angle, Extinction Angle control), Single quadrant semi converter, two quadrant full converter and dual Converter	
21	Controlled rectifiers Techniques(Phase Angle, Extinction Angle control), Single quadrant semi converter, two quadrant full converter and dual Converter	
22	Working of single-phase half wave controlled converter with Resistive and R-L loads.	
23	Working of single-phase half wave controlled converter with Resistive and R-L loads.	
24	Understand need of freewheeling diode.	
25	Working of single phase fully controlled converter with resistive and R- L loads.	
26	Working of three-phase half wave controlled converter with Resistive load.	
27	Working of three phase fully controlled converter with resistive load.	
28	Working of single phase AC regulator.	
29	Working principle of step up & step down chopper.	
30	Control modes of chopper	
31	Operation of chopper in all four quadrants.	
32	Classify inverters.	
33	Explain the working of series inverter.	
34	Explain the working of parallel inverter	
35	Explain the working of single-phase bridge inverter.	
36	Explain the basic principle of Cyclo-converter.	
37	Explain the working of single-phase step up & step down Cyclo-converter.	
38	Explain the working of single-phase step up & step down Cyclo-converter.	
39	Applications of Cyclo-converter.	
40	List applications of power electronic circuits.	

41	List the factors affecting the speed of DC Motors.	
42	Speed control for DC Shunt motor using converter.	
43	Speed control for DC Shunt motor using chopper.	
44	List the factors affecting speed of the AC Motors.	
45	Speed control of Induction Motor by using AC voltage regulator.	
46	Speed control of induction motor by using converters and inverters (V/F control).	
47	Working of UPS with block diagram.	
48	Battery charger circuit using SCR with the help of a diagram.	
49	Basic Switched mode power supply (SMPS) - explain its working & applications	
50	Introduction of Programmable Logic Controller(PLC),Advantages of PLC.	
51	Different parts of PLC by drawing the Block diagram and purpose of each part of PLC,Applications of PLC.	
52	Ladder diagram,Description of contacts and coils in the following states i)Normally open ii) Normally closed iii) Energized output iv)latched Output v)branching	
53	Ladder diagrams for i) AND gate ii) OR gate and iii) NOT gate.	
54	Ladder diagrams for combination circuits using NAND,NOR, AND, OR and NOT	
55	Timers-i)T ON ii) T OFF and iii)Retentive timer	
56	Counters-CTU, CTD	
57	Ladder diagrams using Timers and counters	
58	PLC Instruction set	
59	Ladder diagrams for following (i) DOL starter and STAR-DELTA starter (ii) Stair case lighting (iii) Traffic light Control (iv) Temperature Controller.	
60	Special control systems- Basics DCS & SCADA systems Computer Control–Data Acquisition, Direct Digital Control System (Basics only)	

Saubhagya Ranjan Behra

Signature of the Faculty

Signature of the H.O.D