GOVERNMENT POLYTECHNIC NUAPADA
DEPARTMENT OF ELECTRICAL ENGINEERING

LESSON PLAN

DISCIPLINE: **ELECTRICAL ENGINEERING**	SEMESTER: **5TH SEM**	NAME OF THE TEACHING FACULTY: **MR. MUKESH KUMAR SAHU**	
SUBJECT: **TH-5: PE & PLC**	NO. OF DAYS/WEEK CLASS ALLOTTED: **04**	SEMESTER FROM DATE: **15-09-2022** TO **22-12-2022** NO. OF WEEKS ALLOTTED: **14 WEEKS**	
WEEK	CLASS DAY	DATE	THEORY / PRACTICAL TOPICS
1ST	01	16-09-2022	**UNDERSTAND THE CONSTRUCTION AND WORKING OF POWER** 1.1 Introduction to Power Electronics circuits • construction, Operation, V-I characteristics & application of power diode
2ND	01	19-09-2022	▪ construction, Operation, V-I characteristics & application of power SCR, DIAC, TRIAC
	02	20-09-2022	▪ construction, Operation, V-I characteristics & application of power Power-MOSFET ▪ construction, Operation, V-I characteristics & application of GTO & IGBT
	03	21-09-2022	1.2 Two transistor model of SCR
	04	23-09-2022	1.3 Gate characteristics of SCR 1.4 switching char. Of SCR during Turn ON and turn OFF
3RD	01	26-09-2022	1.5 turn ON method of SCR 1.6 turn OFF methods of SCR 1.6.1 Load commutation 1.6.2 Resonant pulse commutation
	02	27-09-2022	1.7 voltage and current ratings of SCR
	03	28-09-2022	1.8 Protection of SCR over voltage protection 1.8.1 over current protection 1.8.2 gate protection
	04	30-09-2022	1.9 firing circuit 1.9.1 general layout diagram of firing circuit 1.9.2 R firing circuit

4TH	01	10-09-2022	1.9.3 R-C firing circuit 1.9.4 UJT pulse triggering circuit 1.9.5 Synchronous triggering (Ramp triggering)
	02	11-09-2022	**UNDERSTAND THE WORING OF CONVERTERS, AC REGULATORS AND CHOPPERS** 2.1 controlled rectifiers techniques (phase angle, extinction angle control), single quadrant semi-converter, two quadrant full converter and dual converter
	03	12-10-2022	2.2 working of single-phase half-wave-controlled converter with R load and RL load
	04	14-10-2022	2.3 Understand need of freewheeling diode
5TH	01	17-10-2022	2.4 working of single-phase fully controlled converter with R load, RL load
	02	18-10-2022	2.5 working of three-phase half wave-controlled converter with R load
	03	19-10-2022	2.6 working of three phase fully controlled converter with R load
	04	21-10-2022	2.7 working of single-phase AC regulator
6TH	01	25-10-2022	2.8 working principle of step-up and step-down converter
	02	26-10-2022	2.9 control modes of chopper
	03	28-10-2022	2.10 operation of chopper in all four quadrants
7TH	01	31-10-2022	**UNDERSTAND THE INVERTERS AND CYCLO-CONVERTERS** 3.1 classify inverters 3.2 explain the working of series inverter
	02	01-11-2022	3.3 explain the working of parallel inverter
	03	02-11-2022	3.4 explain the working of single-phase bridge inverter… contd..
	04	04-11-2022	3.4 explain the working of single-phase bridge inverter
8TH	01	07-11-2022	3.5 explain the basic principle of cyclo-converter
	02	09-11-2022	3.6 explain the working of single-phase step-up converter… contd..
	03	11-11-2022	3.6 explain the working of single-phase step-down cyclo-converter
9TH	01	14-11-2022	3.7 application of cyclo-converter
	02	15-11-2022	**UNDERSTAND APPLICATION OF POWER ELECTRONICS CIRCUIT** 4.1 list application of power electronics circuit
	03	16-11-2022	4.2 List the factor affecting the speed of DC motors
	04	18-11-2022	4.3 speed control for DC shunt motor using converter
10th	01	21-11-2022	4.4 speed control for DC shunt motor using chopper
	02	22-11-2022	4.5 List of factors affecting speed of the AC motors
	03	23-11-2022	4.6 speed control of induction motor by using AC voltage regulator
	04	25-11-2022	4.7 speed control of induction motor by using converters and Inverter
11TH	01	28-11-2022	4.8 working of UPS with block diagram
	02	29-11-2022	4.9 battery charger circuit using SCR with the help of diagram
	03	30-11-2022	4.10 basic switched mode power supply (SMPS)- explain its working & Applications
	04	01-12-2022	**PLC AND ITS APPLICATIONS** 5.1 introduction to Programmable Logic Controller (PLC) 5.2 advantages of PLC

12th	01	05-12-2022	5.3 different parts of PLC by drawing the block diagram and purpose of each part of PLC 5.4 application of PLC
	02	06-12-2022	5.5 ladder diagram 5.6 description of contacts & coils in the following states 5.6.1 normally open 5.6.2 normally closed 5.6.3 energized output 5.6.4 latched output 5.6.5 branching
	03	07-12-2022	5.7 ladder diagram 5.7.1 AND gate 5.7.2 OR gate 5.7.3 NOT gate
	04	09-12-2022	5.8 ladder diagram for combination circuit using NAND, NOR, AND, OR, NOT
13TH	01	12-12-2022	5.9 Timers 5.9.1 T-ON 5.9.2 T-OFF 5.9.3 Retentive timer
	02	13-12-2022	5.10 counters- CTU, CTD 5.11 Ladder diagrams using Timers and counters
	03	14-12-2022	5.12 PLC instruction set 5.13 ladder diagram for following 5.13.1 DOL starter & STAR_DELTA starter 5.13.2 Stair case lighting
	04	16-12-2022	5.13.3 Traffic light control 5.13.4 Temperature controller
14TH	01	19-12-2022	5.14 special control systems- Basic DCS & SCADA systems
	02	20-12-2022	5.15 Computer control- Data Acquisition, Direct Digital control system (Basics only)
	03	21-12-2022	REVISION CLASSES Q&A DISCUSSION

Mukesh Kumar Sahu

Sign. Of Faculty

Sign. Of H.O.D.

Sign. Of Academic Coordinator

Principal
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