BHUBANANANDA ORISSA SCHOOL OF ENGINEERING

LESSON PLAN

BY: PRADEEP KUMAR DHAL SAMANT

SUBJECT: POWER ELECTRONICS & PLC

SEMESTER: 5TH

BRANCH: E&TC

Bhubanananda Orissa School of Engineering

Lesson Plan

Discipline: ETC	Semester: 5th	Name of the Teaching Faculty: PRADEEP KUMAR DHAL SAMANT
Subject: POWER ETC & PLC(TH5)	No of Days/per week class allotted:4	Semester from 15.09 2022 to 22.12.2022 No of weeks:14
Week No.	Class Day (Tues, Thurs, Fri & Saturday)	Theory Topics
1st	15.09.2022	**Chapter-1-UNDERSTAND THE CONSTRUCTION AND WORKING OF POWER ELECTRONICS** Introduction to Power Electronics and its Application. POWER DIODE, SCR, DIAC, TRIAC, POWER MOSFET, GTO & IGBT
	16.09.2022	**1.1** Construction, Operation, V-I characteristics & application of power diode
	17.09.2022	Construction, Operation, V-I characteristics & application of Silicon controlled Rectifier
2nd	20.09.2022	Construction, Operation, V-I characteristics & application of DIAC
	22.09.2022	Construction, Operation, V-I characteristics & application of TRIAC
	23.09.2022	Construction, Operation, V-I characteristics & application of POWER MOSFET
	24.09.2022	Construction, Operation, V-I characteristics & application of GTO
3rd	27.09.2022	Construction, Operation, V-I characteristics & application of IGBT
	29.09.2022	**1.2** Two transistor analogy of SCR.
	30.09.2022	**1.3** Gate characteristics of SCR.
	01.10.2022	**1.4** Switching characteristics of SCR during turn on & turn off.
4th	11.10.2022	**1.5** Turn on methods of SCR.
	13.10.2022	**1.6** Turn off methods of SCR (Line commutation and Forced commutation) **1.6.1** Load Commutation **1.6.2** Resonant pulse commutation
	14.10.2022	**1.7** Voltage and Current ratings of SCR.
	15.10.2022	**1.8** Protection of SCR **1.8.1** Over voltage protection

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5th	18.10.2022	**1.8.2** Over current protection **1.8.3** Gate protection
	20.10.2022	**1.9** Firing circuits **1.9.1** General layout of diagram of firing circuit **1.9.2** R firing circuit **1.9.3** R-C firing circuit
	21.10.2022	**1.9.4** UJT pulse trigger circuit **1.9.5** Synchronous triggering (Ramp Triggering)
	22.10.2022	**1.10** Design of Snubber Circuits **CLASS TEST – I**
6th	25.10.2022	**Chapter-2-UNDERSTAND THE WORKING OF CONVERTERS, AC REGULATORS AND CHOPPERS.**
	27.10.2022	**2.1** Controlled rectifiers Techniques (Phase Angle, Extinction Angle control)
	28.10.2022	Single quadrant semi converter, two quadrant full converter and dual Converter
	29.10.2022	**2.2** Working of single-phase half wave controlled converter with Resistive and R-L loads. **2.3** Understand need of freewheeling diode
7th	01.11.2022	**2.4** Working of single phase fully controlled converter with resistive and R- L loads. **2.5** Working of three-phase half wave controlled converter with Resistive load.
	03.11.2022	**2.6** Working of three phase fully controlled converter with resistive load. **2.7** Working of single phase AC regulator
	04.11.2022	**2.8** Working principle of step up & step down chopper. **2.9** Control modes of chopper
	05.11.2022	**2.10** Operation of chopper in all four quadrants.
8th	10.11.2022	**Chapter-3-UNDERSTAND THE INVERTERS AND CYCLO-CONVERTERS** **3.1**Classify inverters. **3.2** Explain the working of series inverter
	11.11.2022	**3.3** Explain the working of parallel inverter.
	12.11.2022	**3.4** Explain the working of single-phase bridge inverter.
9th	15.11.2022	**3.5** Explain the basic principle of Cyclo-converter.
	17.11.2022	**3.6** Explain the working of single-phase step up & step down Cyclo-converter.
	18.11.2022	**3.7** Applications of Cyclo-converter.
	19.11.2022	**Chapter-4- UNDERSTAND APPLICATIONS OF POWER ELECTRONIC CIRCUITS** **4.1** List applications of power electronic circuits.

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10th	22.11.2022	**4.2** List the factors affecting the speed of DC Motors. **4.3** Speed control for DC Shunt motor using converter.
	24.11.2022	**4.4** Speed control for DC Shunt motor using chopper. **4.5** List the factors affecting speed of the AC Motors.
	25.11.2022	**4.6** Speed control of Induction Motor by using AC voltage regulator. **Class Test – II**
	26.11.2022	**4.7** Speed control of induction motor by using converters and inverters (V/F control).
11th	29.11.2022	**4.8** Working of UPS with block diagram. **4.9** Battery charger circuit using SCR with the help of a diagram.
	01.12.2022	**4.10** Basic Switched mode power supply (SMPS) - explain its working & applications
	02.12.2022	**Chapter-5-PLC AND ITS APPLICATIONS** **5.1** Introduction of Programmable Logic Controller (PLC) **5.2** Advantages of PLC
	03.12.2022	**5.3** Different parts of PLC by drawing the Block diagram and purpose of each part of PLC.
12th	06.12.2022	**5.4** Applications of PLC **5.5** Ladder diagram
	08.12.2022	**5.6** Description of contacts and coils in the following states **i)**Normally open **ii)** Normally closed **iii)** Energized output **iv)** Latched Output **v)** Branching
	09.12.2022	**5.7** Ladder diagrams for **i)** AND gate **ii)** OR gate and **iii)** NOT gate **iv)** NAND gate **v)** NOR gate **vi)** Ex-OR gate **5.8** Ladder diagrams for combination circuits using NAND, NOR, AND, OR and NOT gate.
	10.12.2022	**5.9** Timers-**i)** T ON **ii)** T OFF and **iii)** Retentive timer **5.10** Counters-CTU, CTD
13th	13.12.2022	**5.11** Ladder diagrams using Timers and counters
	15.12.2022	**5.12** PLC Instruction set
	16.12.2022	**5.13** Ladder diagrams for following **(i)** DOL starter and STAR-DELTA starter**(ii)** Stair case lighting
	17.12.2022	**5.13** Ladder diagrams for following **(iii)** Traffic light Control**(iv)** Temperature Controller

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14th	20.12.2022	**5.14** Special control systems – Basics DCS & SCADA svstems
	22.12.2022	**5.15** Computer control – Data Acquisition, Direct Digital Control svstems (Basics onlv)
		2nd Internal
		REVISION AND IMPORTANT QUESTION DISCUSSED

13/09/2022
Signature of Faculty

13/09/2022
HOD (E&TC)
Sr. Lecturer
Electronics & Telecomm. Engg.
BOSE, Cuttack

13/9
Principal