BHUBANANANDA ORISSA SCHOOL OF ENGINEERING

LESSON PLAN

BY : PRADEEP KUMAR DHAL SAMANT (Lecturer)

SUBJECT: POWER ELECTRONICS & PLC

SEMESTER: 5TH

BRANCH: E&TC

Bhubanananda Orissa School of Engineering

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Discipline: E&TC	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 01.07 2024 to 08.11.2024 No of weeks:18
Week No.	Class Day (Mon, Wednes, Fri & Saturday)	Theory Topics
1st	01-07-2024	**Chapter-1-UNDERSTAND THE CONSTRUCTION AND WORKING OF POWER ELECTRONICS** Introduction to Power Electronics and its Application.
	03-07-2024	Power Electronics Components: POWER DIODE, SCR, DIAC, TRIAC, POWER MOSFET, GTO & IGBT
	05-07-2024	**1.1** Construction, Operation, V-I characteristics & application of power diode
	06-07-2024	Construction, Operation, V-I characteristics & application of Silicon controlled Rectifier
2nd	08-07-2024	Construction, Operation, V-I characteristics & application of DIAC
	10-07-2024	Construction, Operation, V-I characteristics & application of TRIAC
	12-07-2024	Construction, Operation, V-I characteristics & application of POWER MOSFET
	13-07-2024	Construction, Operation, V-I characteristics & application of GTO
3rd	15-07-2024	Construction, Operation, V-I characteristics & application of IGBT
	19-07-2024	**1.2** Two transistor analogy of SCR.
	20-07-2024	**1.3** Gate characteristics of SCR.
4th	22-07-2024	**1.4** Switching characteristics of SCR during turn on.
	24-07-2024	Switching characteristics of SCR during turn off.
	26-07-2024	**1.5** Turn on methods of SCR.
	27-07-2024	**1.6** Turn off methods of SCR (Line commutation and Forced commutation) **1.6.1** Load Commutation
5th	29-07-2024	**1.6.2** Resonant pulse commutation
	31-07-2024	**1.7** Voltage and Current ratings of SCR.

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	02-08-2024	**1.8** Protection of SCR **1.8.1** Over voltage protection
	03-08-2024	**1.8.2** Over current protection **1.8.3** Gate protection
6th	05-08-2024	**1.9** Firing circuits **1.9.1** General layout of diagram of firing circuit **1.9.2** R firing circuit
	07-08-2024	**1.9.3** R-C firing circuit
	09-08-2024	**1.9.4** UJT pulse trigger circuit **1.9.5** Synchronous triggering (Ramp Triggering)
	10-08-2024	**1.10** Design of Snubber Circuits
7th	12-08-2024	**CLASS TEST – I**
	14-08-2024	**Chapter-2-UNDERSTAND THE WORKING OF CONVERTERS, AC REGULATORS AND CHOPPERS.**
	16-08-2024	**2.1** Controlled rectifiers Techniques (Phase Angle, Extinction Angle control). Single quadrant semi converter, two quadrant full converter and dual Converter
	17-08-2024	**2.2** Working of single-phase half wave controlled converter with Resistive and R-L loads. **2.3** Understand need of freewheeling diode
8th	21-08-2024	**2.4** Working of single phase fully controlled converter with resistive and R- L loads.
	23-08-2024	**2.5** Working of three-phase half wave controlled converter with Resistive load.
	24-08-2024	**2.6** Working of three phase fully controlled converter with resistive load.
9th	28-08-2024	**2.7** Working of single phase AC regulator
	30-08-2024	**2.8** Working principle of step up & step down chopper. **2.9** Control modes of chopper
	31-08-2024	**2.10** Operation of chopper in all four quadrants.
10th	02-09-2024	**Chapter-3-UNDERSTAND THE INVERTERS AND CYCLO-CONVERTERS** **3.1**Classify inverters. **3.2** Explain the working of series inverter
	04-09-2024	**3.3** Explain the working of parallel inverter.
	06-09-2024	**3.4** Explain the working of single-phase bridge inverter.
	09-09-2024	**3.5** Explain the basic principle of Cyclo-converter.

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11th	11-09-2024	**3.6** Explain the working of single-phase step up & step down Cyclo-converter.
	13-09-2024	**3.7** Applications of Cyclo-converter.
	14-09-2024	**1st INTERNAL ASSESSMENT**
	18-09-202	**Chapter-4- UNDERSTAND APPLICATIONS OF POWER ELECTRONIC CIRCUITS** **4.1** List applications of power electronic circuits.
12th	20-09-2024	**4.2** List the factors affecting the speed of DC Motors. **4.3** Speed control for DC Shunt motor using converter.
	21-09-2024	**4.4** Speed control for DC Shunt motor using chopper. **4.5** List the factors affecting speed of the AC Motors.
13th	23-09-2024	**4.6** Speed control of Induction Motor by using AC voltage regulator.
	25-09-2024	**4.7** Speed control of induction motor by using converters and inverters (V/F control).
	27-09-2024	**4.8** Working of UPS with block diagram.
	28-09-2024	**4.9** Battery charger circuit using SCR with the help of a diagram.
14th	30-09-2024	**4.10** Basic Switched mode power supply (SMPS) - explain its working & applications
	04-10-2024	**CLASS TEST – II**
	05-10-2024	**Chapter-5-PLC AND ITS APPLICATIONS** **5.1** Introduction of Programmable Logic Controller (PLC) **5.2** Advantages of PLC
15th	14-10-2024	**5.3** Different parts of PLC by drawing the Block diagram and purpose of each part of PLC.
	18-10-2024	**5.4** Applications of PLC **5.5** Ladder diagram
	19-10-2024	**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
16th	21-10-2024	**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
	23-10-2024	**5.8** Ladder diagrams for combination circuits using NAND, NOR, AND, OR and NOT gate.
	25-10-2024	**5.9** Timers-**i)** T ON **ii)** T OFF and **iii)** Retentive timer **5.10** Counters-CTU, CTD

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	26-10-2024	**5.11** Ladder diagrams using Timers and counters
17th	28-10-2024	**5.12** PLC Instruction set
	30-10-2024	**5.13** Ladder diagrams for following **(i)** DOL starter and STAR-DELTA starter**(ii)** Stair case lighting
	01-11-2024	**5.13** Ladder diagrams for following **(iii)** Traffic light Control**(iv)** Temperature Controller
	02-11-2024	**5.14** Special control systems – Basics DCS & SCADA systems
18th	04-11-2024	**5.15** Computer control – Data Acquisition, Direct Digital Control systems (Basics only)
	06-11-2024	**2nd Internal Exam**
	08-11-2024	**IMPORTANT QUESTION DISCUSSION.**

28/06/2024

Signature of Faculty

HOD (E&TC)
Sr. Lecturer
Electronics & Telecomm. Engg
BOSE, Cuttack

Principal