



NILASAIL INSTITUTE OF SCIENCE & TECHNOLOGY
SERGARH-756060, BALASORE (ODISHA)
(Approved by AICTE & affiliated to SCTE & VT, Odisha)



LESSON PLAN

SUBJECT: Th-5 (POWER ELECTRONICS AND PLC)

CHAPTERWISE DISTRIBUTION OF PERIODS

Sl. No.	Name of the chapter as per the Syllabus	No. of Periods as per the Syllabus	No. of periods actually needed
1	Understand The Construction And Working Of Power Electronic Devices	18	18
2	Understand The Working Of Converters, Ac Regulators And Choppers.	12	12
3	Understand The Inverters And Cyclo-Converters	8	8
4	Understand Applications Of Power Electronic Circuits	10	10
5	PLC And Its Applications	12	12
	Total Period:	60	60

Discipline: ELECTRICAL ENGG.	Semester: 5 th	Name of the Teaching Faculty : Er. ANJARUS SWALEHIN
Week	ClassDay	Theory/PracticalTopics
1st	1st	1.1 Construction, Operation, V-I characteristics & application of power diode, SCR,DIAC,TRIAC, Power MOSFET,GTO &IGBT
	2nd	1.2TwotransistoranalogyofSCR.
	3rd	1.3GatecharacteristicsofSCR.
	4th	1.4SwitchingcharacteristicofSCRduringturnonandturnoff.
2nd	1st	1.5TurnonmethodsofSCR.
	2nd	1.6 Turn off methods of SCR (Line commutation and Forced commutation) 1.6.1 Load Commutation
	3rd	1.6.2Resonantpulsecommutation
	4th	1.7VoltageandCurrentratingsofSCR.
3rd	1st	ProtectionofSCR Overvoltageprotection
	2nd	1.8.2Overcurrentprotection
	3rd	1.8.3Gateprotection
	4th	FiringCircuits Generallayoutdiagramoffiringcircuit

4th	1st	1.9.2 R firing circuits
	2nd	1.9.3 R-C firing circuit
	3rd	1.9.4 UJT pulse trigger circuit
	4th	1.9.5 Synchronous triggering (Ramp Triggering)
5th	1st	1.10 Design of Snubber Circuits
	2nd	2.1 Controlled rectifiers Techniques (Phase Angle, Extinction Angle control), Single quadrant semiconverter, two quadrant full converter and dual
	3rd	2.2 Working of single-phase half wave controlled converter with Resistive and R-L loads.
	4th	2.3 Understand need of freewheeling diode.
6th	1st	2.4 Working of single phase fully controlled converter with resistive and R-L loads.
	2nd	2.5 Working of three-phase half wave controlled converter with Resistive load
	3rd	2.6 Working of three phase fully controlled converter with resistive load.
	4th	2.7 Working of single phase AC regulator.
7th	1st	2.8 Working principle of step up & step down chopper.
	2nd	2.9 Control modes of chopper
	3rd	2.10 Operation of chopper in all four quadrants.
	4th	3.1 Classify inverters.

8th	1st	3.2 Explain the working of series inverter.
	2nd	3.3 Explain the working of parallel inverter
	3rd	3.4 Explain the working of single-phase bridge inverter.
	4th	3.5 Explain the basic principle of Cyclo-converter.
9th	1st	3.6 Explain the working of single-phase step up & step down Cyclo-converter.
	2nd	3.7 Application of Cyclo-converter.
	3rd	4.1 List applications of power electronic circuits.
	4th	4.2 List the factors affecting the speed of DC Motors.
10th	1st	4.3 Speed control for DC shunt motor using converter.
	2nd	4.4 Speed control for DC shunt motor using chopper.
	3rd	4.5 List the factors affecting speed of the AC Motors.
	4th	4.6 Speed control of Induction Motor by using AC voltage regulator.
11th	1st	4.7 Speed control of induction motor by using converters and inverters (V/F control).
	2nd	4.8 Working of UPS with block diagram.
	3rd	4.9 Battery charger circuit using SCR with
	4th	4.10 Basic Switched mode power supply (SMPS)-explain its working & applications

12th	1st	5.1IntroductionofProgrammableLogicController(PLC)
	2nd	5.2AdvantagesofPLC
	3rd	5.3DifferentpartsofPLCbydrawingtheBlockdiagramandpurpose ofeachpartof PLC.
	4th	5.4ApplicationsofPLC
13th	1st	5.5Ladderdiagram
	2nd	5.6Descriptionofcontactsandcoilsinthefollowingstates i) Normally open ii) Normally closed iii) Energized output iv)latched Output v)
	3rd	5.7Ladderdiagramsfori)ANDgateii)ORgateandiii)NOTgate.
	4th	5.8 Ladder diagrams for combination circuits using NAND,NOR, AND, OR and NOT
14th	1st	5.9Timers-i)TONii)TOFFandiii)Retentivetimer
	2nd	5.10Counters-CTU,CTD
	3rd	5.11LadderdiagramssusingTimersandcounters
	4th	5.12PLCInstructionset
15th	1st	5.13Ladderdiagramsforfollowing (i) DOL starter and STAR-DELTA starter (ii) Stair case lighting (iii) Traffic light
	2nd	5.14Specialcontrolsystems-BasicsDCS&SCADAsystems
	3rd	5.15 Computer Control–Data Acquisition, Direct Digital Control System (Basics only)
	4th	CLASSTEST

