NILASAILAINSTITUTEOFSCIENCE&TECHNOLOGY
SERGARH-756060, BALASORE (ODISHA)
(ApprovedbyAICTE&affiliatedtoSCTE&VT,Odisha)

LESSONPLAN

SUBJECT:Th-5(POWERELECTRONICSANDPLC)

CHAPTERWISEDISTRIBUTIONOFPERIODS

Sl.No.	NameofthechapteraspertheSyllabus	No.of Periods asper the Syllabus	No. of periods actually needed
1	UnderstandTheConstructionAndWorkingOf Power ElectronicDevices	18	18
2	UnderstandTheWorkingOfConverters,AcRegulatorsAnd Choppers.	12	12
3	UnderstandTheInvertersAndCyclo-Converters	8	8
4	UnderstandApplicationsOfPowerElectronicCircuits	10	10
5	PLCAndItsApplications	12	12
	TotalPeriod:	60	60

Discipline: ELECTRICAL ENGG.	Semester: 5th	Name of the Teaching Faculty : Er.SOUMYAJIT ROUT
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	1.9.2Rfiringcircuits
	2nd	1.9.3R-Cfiringcircuit
	3rd	1.9.4UJTpulsetriggercircuit
	4th	1.9.5Synchronoustriggering(RampTriggering)
5th	1st	1.10DesignofSnubberCircuits
	2nd	2.1 Controlled rectifiers Techniques(Phase Angle, Extinction Angle control), Single quadrantsemiconverter,twoquadrantfullconverteranddual
	3rd	2.2Workingofsingle-phasehalfwavecontrolledconverterwith Resistive and R-L loads.
	4th	2.3Understandneedoffreewheelingdiode.
6th	1st	2.4Workingofsinglephasefullycontrolledconverterwithresistive andR-Lloads.
	2nd	2.5Workingofthree-phasehalfwavecontrolledconverterwith Resistiveload
	3rd	2.6Workingofthreephasefullycontrolledconverterwithresistive load.
	4th	2.7WorkingofsinglephaseACregulator.
7th	1st	2.8Workingprincipleofstepup&stepdownchopper.
	2nd	2.9Controlmodesofchopper
	3rd	2.10Operationofchopperinallfourquadrants.
	4th	3.1Classifyinverters.

8th	**1st**	3.2Explaintheworkingofseriesinverter.
	2nd	3.3Explaintheworkingofparallelinverter
	3rd	3.4Explaintheworkingofsingle-phasebridgeinverter.
	4th	3.5ExplainthebasicprincipleofCyclo-converter.
9th	**1st**	3.6 Explain the working of single-phase step up & step down Cyclo-converter.
	2nd	3.7ApplicationsofCyclo-converter.
	3rd	4.1Listapplicationsofpowerelectroniccircuits.
	4th	4.2Listthefactorsaffectingthespeedof DCMotors.
10th	**1st**	4.3SpeedcontrolforDCShuntmotorusingconverter.
	2nd	4.4SpeedcontrolforDCShuntmotorusingchopper.
	3rd	4.5ListthefactorsaffectingspeedoftheACMotors.
	4th	4.6SpeedcontrolofInductionMotorbyusingACvoltageregulator.
11th	**1st**	4.7 Speed control of induction motor by using converters and inverters (V/F control).
	2nd	4.8WorkingofUPSwithblockdiagram.
	3rd	4.9BatterychargercircuitusingSCRwith
	4th	4.10BasicSwitchedmodepowersupply(SMPS)-explainitsworking& 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	5.11LadderdiagramsusingTimersandcounters
	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