

SPECIALIZED EQUIPMENT

Name of Laboratory	Specialized Equipments	Details	Utilization details from the Perspective of PO Attainment
Power Electronics Lab	3Ph VSU fed PWM inverter AC drive:	1. 3 phase VSI fed PWM inverter AC drive Kit, S.N 95129-05 2. Power DC motor 1HP/0.75kW/180-220V/1500/1800rpm/5.2A, S.N 100956 3. Induction Motor 440v/1.5A/1440rpm, S.N 12-2010	Meeting PO1 and PO2
	3Ph closed loop resonant Converter fed induction motor drive	1. 3Ph closed loop resonant converter : S.N 95145-05 2. Induction Motor with mechanical loading arrangement with techogenerator 48V,2A,1500rpm 3. Zero current switching module	-----do-----
	3 Ph IGBT based Inverter with rectifier module on stack with all functional tests	Model: MD B6U 415/560-45F+B6C1 600/415-30F Make: Semikron	-----do-----
	(A) IGBT/MOSFET Trainer (B) Accessories (LOAD)	1) MOSFET Module (ITB PEC 16 M1) (2) MOSFET Module (ITB PEC 16 M2) (3) Module IGBT (ITB PEC 16 M3) (4) PWM inverter (ITB PEC 16 M4) (5) Chopper Control (ITB PEC 16 M5) B. (1) Inductive load ITB PEC 13 ACC1 (2) Resistive load ITB PEC 13 ACC2 (3) PMDC motor as Balancing load ITB PEC 13 ACC3 (4) Lamp load ITB PEC 13 ACC4 (5) Output Step-up Transformer – 50VA ITB PEC 16 ACC1 (6) Output Step-up Transformer –100VA ITB PEC 16 ACC2 (7) Digital Panel Meter set fitted 4 No. digital meters (8) Hall Effect Current Transformer ITB PEC 16 ACC3 (9) PEC 16EXTTR	-----do-----
	Power Quality Analyzer	Make: FLUKE Model : 43B/0085	-----do-----
	VSI PWM Scheme Direct Torque Control (DTC)	1. 3-phase VVVF drive trainer, Model XPO-VVVF 2. 0.5 HP squirrel cage induction motor 220-230 V ac with break pully connected 3. Patel cord etc. (double sided)	-----do-----
	Brushless DC motor with ¼ HP with control unit and motor	1. Brushless DC motor trainer. 2. ¼ HP BLDC motor with loading break pulley arrangement 3. Patel cord set shrouded and 9 pin connector, cable and audio socket conn. Cable.	-----do-----
	Reversible 4-Quad Flux Vector Control Drive for	1. 3-phase VVVF drive trainer, Model XPO-VVVF	-----do-----

Induction Motor 3 Ph	<ol style="list-style-type: none"> 2. 1 HP squirrel cage induction motor with break pully arrangement, 415 V, 50 Hz, 1440 rpm 3. Patel cord set shrouded cable 4. Drive view software CD 	
MOSFET based PWM Inverter speed controller	<ol style="list-style-type: none"> 1. Power Electronics Trainer Model XPO-PE 2. PE 6 panel. 3. AC/DC universal motor (sl. No. IK-4, 1/12 HP. 4. AC motor speed control trainer. Model XPO-APPE 5. Choke-40W with 100 W and 15 W bulbs. 6. PMDC motor, 200V, 200W, 1.2 A, 2000 RPM, sl.no. TC-04-09.10 	-----do-----
3-phase Fully Controlled Bridge Rectifier	<ol style="list-style-type: none"> 1. 3-phase HV Thyristor control trainer. Model XPO-APPE 2.3-phase FHP (o.05 HP) motor with break pully loading arrangement. M/C No. 07.07.7183A 3.Shrouded patel cord set 4.100 W bulb. 5.3-phase isolation Transformers-2nos 	-----do-----
Power Factor Improvement Technique Kit	<ol style="list-style-type: none"> 1.Power Electronics Trainer, Model XPO-PE. 2.PE 1 Panel 3.XPO sensor trainer, Model XPO-MIT 4.MIT 8 Panel 5.Process-I (Modified box) for loading 6.Patch chord set and 9-pin connector cable. 7.3-phase transformer with terminal panel-2nos., model 3-phase ISO X'mer Sl. No. 1012001, 1012002 	-----do-----
DSP based 3Ph Induction Motor Trainer Kit	<ol style="list-style-type: none"> 1. DSP Based 3Ph Induction Motor Trainer 2.Induction motor 0.75kw 1HP, 1.9A, 1440rpm, 415V 3.Power DC Motor1HP/0.75KW/5.2A 4.Digital Tachometer 	-----do-----
PC based DC Drive trainer	<ol style="list-style-type: none"> 1.PC based DC Drive trainer S.N. 95129-03 2.DC Motor Type PMG15,180V, 0.6A, 1700rpm 3.Digital Techometer 	-----do-----
Stepper motor with control unit. (With motor)	<ol style="list-style-type: none"> 1. Stepper motor with control unit, S.N. 95129-04-1 2. DC slipping motor, Type stm 981, Torque 7kg, 6VDC, 1.4A/phase, S.N. 6-11-2609 3. Power Supply 5VS.N1105022 4. Microprocessor based kit (8085), S.N. 95129-04-02 	-----do-----
Sensorless Vector Control Drive for 3-ph, 1-hp induction motor	<ol style="list-style-type: none"> 1. Sensorless Vector Control Drive for 3-ph S.N. 95145-01 2.3phase induction motor with mechanical loading arrangement 1HP/1.9A/ 	-----do-----

		1440rpm/415V 3.Digital Tachometer	
	Closed loop controlled Matrix converter fed induction motor	1. 3-phase matrix converter SN 95145-02 2. Induction motor 3phase with mechanical loading arrangement 415+10%, 50Hz, 0.18/0.25kW, 2700rpm, SN 10061001 3. Diital Tachometer	-----do-----
	DC Motor Drives (SCR & microprocessor based) and DC motor Drive	1. DCmotor drive MOSFET and microcontroller based SN 95145-03-01 2. DC Motor Drives SCR & microprocessor based 3. Power DC motor HP 0.75kW, 180/220V, 5.2A SN 100955-100957 4. Isolation transformer for DC motor drive MOSFET and microcontroller based 5. Digital Tachometer with adapter	-----do-----
	Thyristorised slip power control unit for wound motor induction motor 2 hp. (with motor)	1. Thyristorised slip power control unit SN 95145-04 2. Direct current motor 0.18kW, 0.25HP, 220V, 1A, 1500rpm 3. Slip ring induction motor with mechanical loading arrangement Type SL100, 1.5Hz, 2.2A, 440V 4. Digital Tachometer with adapter	-----do-----
	3 Ph closed loop resonant converter fed induction motor drive	1. 3 Ph closed loop resonant converter SN 95145-05 2. Induction motor with mechanical loading arrangement with techogenerator 48V, 2A, 1500rpm 3. zero current switching module 4. Digital Tachometer with adapter	-----do-----
	Universal Bridge/module	1. Diode bridge module 6 Diode, 1000V, 2A SN 95130-03-01, 95130-03-02 2. SCR bridge module 6SCR, 800V, 6A, SN 95130-03-01, 95130-03-02 3. MOSFET bridge module 6 MOSFET, 500V, 6A, SN 95130-03-01, 95130-03-02 4. IGBT bridge module 6 IGBT, 500V, 6A, SN 95130-03-01, 95130-03-02 5. Isolated gate drivers for MP and any TTL pulse s to MOSFET/IGBT/SCR 6. 3 phase triggering circuit of SCR SN95130-03-01	-----do-----
	CSI- 3 Ph Using MOSFET	1. CSI- 3 Ph Using MOSFET SN95130-06-01 2. Load bank SN95130-06-02	-----do-----
	Programmable Function Generator	25 MHz- 2 Channels Model: 33522B, Make: Agilent	-----do-----
Electrical Machine Lab	D Space Education Kit-	1.Dspace ACE 1104-CLP-USB Educational kit	-----do-----

		(a)DS1104 R&D Control Board (b)CLP 1104 Connector /LED Board (C) CDP-1104 Control Developer software (d)Micro tech Power PC cross Compiler	
	solar PV grid training system	with artificial Grid unit, PVUnitPCU,Control Unit Drivers& Accessories	-----do-----
	Solar PV Emulator	with 4 Independent channels, fixed table simulator and Programming Module, out - put 350-watt channel Along with accessories	-----do-----
Simulation Lab	Digsilent Power Factory	Digsilent	-----do-----
	Power quality analyzer	HIOKI Japan	-----do-----
	MATLAB and SIMULINK family Software	MATLAB-	-----do-----
Virtual Instrumentation Lab	Data acquisition card –NI PCI-6221 M series NI-DAQMX driver software	NI ELVIS	-----do-----
	Data acquisition card-NI PCI-6251, M-series/16 analog input 24 digital I/O 2 analog output/with NI-DAQMX driver software		-----do-----
	Bundle (data acquisition card work station etc-NI ELVIS/1PC-6251		
	Work station –NI ELVIS (for educational -use only)		
	BUNDLE (PXI BUNDLE-PXI-1042 Q CLASSIS /PXI 8186) ACADEMIC BUNDLE		
	STUDENT KIT (NI USB-6008, USB 6008- PLUS LAB VIEW STUDENT EDITION		
	VOLTAGE INPUT MODULE –MODEL 5B30 INPUT RANGE +100mV with 4Hz BANDWIDTH		
	SOFTWARE (LABVIEW) LABVIEW DDS, MEANS STUDIOS, IMAGE VISION, LABVIEW RT , LAB VIEW DSC AND OTHER ADD ON SW		

	Current Probe – 100 Amp (AC/DC) & High Voltage Probe		
	NI ELVIS II+ Circuit Design Bundle (For Academic Use Only)		
	CRIO-9012 Real-Time Power PC Controller for Compact RIO, 128 MB Disc on Chip Storage, 64 MB DRAM		
	DC Shunt Motor & DC Brushless Motor	Motor component, Controller, Wiring Accessories, Accelerator Assembly	
	DC Shunt Motor/3 Phase Slip Ring Induction Motor/ IGBT Based Inverter/ FPGA	Kirlosker	
		Simikron	
		LEM	
	SRM Drive System 1. 4 Phase AHBC IGBT based inverter stack for SRM motor 2. 4 Phase AHBC IGBT based inverter stack for SRM motor (a). FPGA board - Altium NB 3000 (b). PWM Daughtercard (c). SRM Motor with Mechanical loading arrangement (d). Sensors	Simikron	
		Altium	
		Entuple	
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Research facilities/ center of excellence (30)				
Sl. No.	Name of the Facility	Specialized Equipment Name	Equipment Details	Utilization details from the perspective of PO attainment
1.		NI PCI	6251Mseries DAQ card Part no 779070-01 SCB-68 connector box Part no-776844-01 PCI 7831 R series DAQ card Part no- 776797-01 SHC 68-68-EPM shielded cable Part no- 192061-01	

2.		3-phase IGBT based Inverter with rectifier module on stack with all functional Tests	Model: MD B6U 415/560-45F+B6C1 600/415-30F Make: Semikron	
3.		Altium Designer- Customer Board Front End Design- Complete Front End Design(HDL Design, Synthesis and Simulation) & Spice Circuit Simulation	Make: Altium	
4.		(i)Altium NB3000 FPGA kit with Spartan 3AN Device	Make: Altium	
5.		Analog Mixed Signal Peripheral Card Contains 12-bit, 16 Channels of ADC & 8 PWM drivers, 34 Free Digital I/O	Make: Entuple	
6.	Solar Array Simulator	Solar Array Simulator	Model: E4362A Agilent pre configured Solar array simulator with custom E-436A modules Make: AGILENT	
7.		Data Acquisition with Reconfigurable I/O controller	Model-NI PXI-8820, PXI-7833R, SCB-68A, SHC-68-68-RMIO, SHC-68-68-RDIO, PXI-1031 Make- National Instruments (NI)	
8.	Solar Photovoltaic system	Solar Photovoltaic system	Solar PV Module 245Watt((9 Nos.) S.No: ASPL091004416-421 ASPL091004457-459 Array Structure DC MCB Model CIPL-2000 DCDB, 20A Power Conditioning Unit Model: CIPL-ACDB, 20A	

			<p>AC Distribution Box Model: CIPL- ACDB, 20A Static energy meter Data logging system with monitoring Model: PCU Inbuilt Cable requirement Battery bank for 2KW SPV,Rating for each Make: Exide Model: IT500 Gel Lightening arrester Make: Anchor Earthing Kit and all related requirement of system, Make: Anchor Engineering electrical drawing Installation and Manual, Make: CIPL</p>	
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Control Lab	Magnetic Levitation System (MATLAB based)	Feedback	For meeting PO 1 and 2
	Magnetic Levitation System (LABVIEW based)	Feedback	-----do-----
	Digital Pendulum with controller & software	Feedback	-----do-----
	Twin Rotor MIMO System	Feedback	-----do-----
	Rotary Servo Plant a) Ball and Beam module b) Rotary flexible link module w/strain gauge c) Rotary flexible joint module w/optical encoder d) Self-erecting-Rotary inverted Pendulum-w/optical encoder	Quanser	-----do-----
Simulation Lab	Digsilent Power Factory	Digsilent, PF-Education , PF-Research / 25users/1 Users, Version 2017-18 Network License , 29-06-2018	-----do-----
	Power quality analyzer	Model- PW3198-90, Make HIOKI Japan, 31-03-14	-----do-----
	MATLAB and SIMULINK family Software	MATLAB	-----do-----
Measurement & Instrumentation Lab	PC based Process Control for Flow, Liquid level, Temperature & Batch control	Bytronic	-----do-----
	LCR meter Scientific & LCR Meter 500 kHz with DCR Measurement,	Agilent-	-----do-----
	Arbitrary wave form generator	Tektronix,	-----do-----
	Spectrum Analyser	HM 5005	-----do-----
	Instrumentation Tutors SienTech (a) Strain gauge module (b) LVDT module (c) Speed measurement module (d) Thermistor- T.C. tutor (e) Piezo electric pick-up module (f) Force/Load measurement module		-----do-----

Virtual Instrumentation Lab	Data acquisition card –NI PCI-6221 M series NI-DAQMX driver software	NI ELVIS	-----do-----
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