

**GOVT. POLYTECHNIC, MADHEPURA  
DEPARTMENT OF CIVIL ENGG.**

**SURVEY & ADVANCE SURVEY LAB (SUB CODE : 1615306/1615406) III/IV SEMESTER**

Name of Equipment/Instruments/Apparatus	
	Transit Theodolite , 175 mm, with Coated lenses & Optical Plummet , tripod stand box and accessory, Erect Image,
	Cross Staff, Complete with pole made of brass Size - 150 mm
	Adjustable Cross Staff with 2 cylinder of equal dia., rack & pinion and stand. Made of brass
	Automatic Level Magnification 32x, standard deviation per km (double run level)=2.0mm Accessories : Stand: Aluminum (heavy duty)-1no Staff : Aluminum (4m folding)-1no
	Digital Theodolite 2" angle accuracy, 30 x telescope, clear Aperture 45mm two faced LCD display. Tilt compensation automatically, range of compensator +3" nickel hydrogen chargeable battery. Accessories: all standard accessories included complete with manual
	Ranging Rod Made of mild steel, 3m high, alternate red and white paint strips, flag at top, and metal shoe
	Electronic total station instruments ( 2 sec. accuracy ) Erect image , compatible with computer with necessary software and plotter Max - 30X , resolution - 4" effective aperture 45 mm
	Quick Setting Dumpy Level 300mm with tripod stands box and accessory tripod stands box and accessory
	Surveyor's Compass, made of brass with wooden case size -100mm. with stand wooden case size -100mm. with stand
0	Optical Square made of brass
1	Telescopic Levelling Staff made of teakwood with brass fittings Size -4 m.
2	Survey Umbrella with Direct pole with 2 layer of Khaki & blue Drill steel ribs complete with a conduit pipe fitted with strong iron.
3	Leveling staves, folding type made of seasoned pine wood with metal fitting circular bubble as per IS: spec. In two fold, 4 m
4	Plane Table with stand , made of FIR wood incorporated strong battens fitted with inside brass screws, brass plate teak wood stand & aluminum head and brass nut for clamping. -750 x 600. mm with accessories.
5	Metric Chain 20 meter & 30 meter length
6	Invar tape 5 & 20 meter length
7	Offset Rod
8	Climo meter
9	19 E D M
0	20 Line Ranger
1	21 Digital Planimeter
2	22 Polar Planimeter
3	23 Metallic Tape 20 Mtr. & 30 Mtr.
4	24 Prismatic compass with stand

**Building construction Lab (1615307) III SEMESTER**

Sl. No.	Name of Equipment/Instruments/Apparatus
1	Trowel
2	Spatula
3	Spirit level
4	Iron Pan
5	Rammer
6	Spade
7	Sledge hammer
8	Basket
9	Wedge
10	Pickaxe
11	Line and pins
12	Boning Rod
13	Plumb bob
14	Pipe Level
15	Chisel

**Concrete Technology Lab (1615310) III SEMESTER**

	Name of Equipment/Instruments/Apparatus
	Cube Mould of CI Size : 15 x 15 x 15 cm
	Cube Mould of CI Size : 7.06 x 7.06 x 7.06 cm
	NEEDLE VIBRATOR.350mm long x 25mm dia. Vibrating pin having bullet nose vibrating speed 1000 rpm 1/2 hp motor, 1 meter shaft with 2m long flexible shaft. Nozzle Dia 12.5 mm,25mm, 40mm
	Flakiness gauge
	Elongation gauge
	Le-Chatelier's Apparatus for determination of soundness of Cements per IS -5514 & IS4031, comprising mould two glass plates and lead weight.
	Slump Test Apparatus for determining workability of Concrete as per IS 1199 & IS 7320, consisting of slump cone with handles tamping rod, steel base plate and trowel
	Measuring cylinders Capacity 1 & 2 Litres
	Electronic Weighing Balance Capacity 10 Kg
1)	Stiring Rod
1	Vicat's Needle Apparatus. As per IS: 269 , for the determination of normal consistency and setting time of cement complete with one each of Vicat mould having clamping ring, base plate initial needle, final needle consistency plunger and scale marked point marked 0.50 mm without dash port.
2	IS Sieves 20 Cm dia-brass Aperture size 80 mm to 150 micron
3	Vibrating Machine
4	Blaine's Air Permeability Apparatus
5	Vee Bee Consistometer As per IS 1199
6	Compaction Factor Apparatus
7	Aggregate Testing Machine
8	Aggregate crushing value apparatus
9	Density/Sp. Gravity Bottle

**Mechanics of structure ( 1615407) IV SEMESTER**

Sl. No.	Name of Equipment/Instruments/Apparatus
1	Fully Automatic Compression Testing Machine- 2000 KN - stress controlled
2	Curing Tank temperature controlled for 12 nos cubes Temperature Range — 50 C to 100 C.
3	Los Angeles Abrasion Testing machine Consisting of hollow cylinder mounted on a sturdy frame on ball bearings. A detachable shell which extends throughout the inside length of the drum, catches the abrasive charge and does not allow it to fall on the cover. The drum is rotated at a speed of 30-33 rpm by an electric motor.
4	Tile flexure Testing Machine with all its accessories
5	Flexure Strength Testing Machine.:Consisting of light weight rugged high strength frame, double action hydraulic pump, self-aligning roller assembly and hydraulic jack provided with retraction spring. -50KN
6	Digital Platform Balance Capacity 10 Kg
7	Izod Impact Testing apparatus
8	Charpy Impact Testing apparatus
9	Universal Testing Machine Capacity – 1000 KN. Complete with all standard accessories, Electrical Motors, for Tension Test and Compression Test, shear test, bond Test and flexure test stress controlled machine directly connected to computer with necessary software with online load, stress-strain measurements with necessary grips and attachment for concrete specimen/steel bars

**GEO TECHNICAL ENGG. LAB (SUB CODE 1615408) IV SEMESTER**

Sl. No.	Name of Equipment/Instruments/Apparatus
1	Standard Compaction Test App. As per IS: 2720 (Part vii) Specifications: The apparatus consists of one each of compaction mould gun metal, 100 mm id x 127.3mm height x 1000 cc volume complete with collar and base plate. Rammer 2.6 kg x 310 mm controlled fall 150mm wide 127.3mm height,2250cc

Soil Hydrometer IS:2720 (part vi) IS: 3104 used for grain size analysis of soils where more than 10% of the material will pass through 75 microns I.S. sieve manufactured from clear transparent glass having uniform clarity throughout the upper end

I.S. Sieves 20 cm diameter brass Aperture size 4.75 mm, 2.36 mm, 1.18 mm, 600micron, 300 micron, 150 micron and 75 micron as per IS 460

Laboratory C.B.R. Apparatus. Motorised As per IS : 2720 (Part – XVI) The apparatus consists of:- Load Frame, 50Kn Capacity: 3 speeds Mould 150mm dia. x 175mm high Perforated Base Plate for ZI-3087-2 Mould Extension Collar, 150mm i.d. x 50 mm high Penetration Piston, 50mm face dia Adjustable Bracket for Penetration, Dial Gauge Circular Metal Spacer Disc with detachable handle, 148mm dia x 47.7mm high time Annular Metal weight 2.5kg 147mm dia with 53mm dia central hole Perforated Metal Weight 2.5kg 147mm dia with 53mm dia soft Perforated Plate, 148mm dia, with adjustable stem and lock nut , Metal Tripod for Dial Gauge Cutting Collar , Rammer 2.6kg 310mm controlled drop. , Rammer 4.9kg 450mm controlled drop Proving Ring capacity 50Kn Dial Gauge, 25mm travel, 0.01mm least count Optional extras :Annular Metal Weight 5 kg 147 mm dia with 53mm dia central hole. Slotted Metal Weight 5 kg 147mm dia with 53mm dia slot [ IS:9669 & IS:2720(part 15)]

Core Cutter Consisting of cylindrical core cutter 100 mm dia and 130 mm long, steel dolly 25 mm high, rammer with steel rod etc complete as per IS 2720(XXIX) [IS2720(part29)]

Laboratory Vane Shear Apparatus Consisting of a torque head, adjustable in height by means of a lead screw rotated by a drive wheel to enable the vane to be lowered into the specimen. Rotation of the vane is by means of an electric motor.

Infra-Red Moisture Meter The equipment should consists of heating element, thermometer (L shaped) and bulb. The capacity and sensitively should be 10g approx and 5mg approx respectively. The range of the stuff gauge should lie in 0 - 1g.

Direct shear apparatus . motorised with 12 speed . As per IS : 2720 ( part XIII ) Supplied with load yoke with direct and lever system for applying load. Normal stress capacity 8 kg/sq. cm. Load is applied either directly or through a counter balanced detachable lever. Provision is made for the load to be applied either through a steel ball recessed in the loading pad or direct through a boss on the pre calibrated loading yoke. The load unit is provided with v strips and roller strips for frictionless movement of shear box housing. Shear box assembly : comprising direct shear box in two halves for a square specimen size 60 X 60 X 25 mm one pair of plain gripper plates , one pair of perforated gripper plates , one pair of porous stones , one top of loading pad. Shear box housing : Accommodate the direct shear box assembly , complete with two ball roller strips. specimen cutter : for cutting 60 X60 X 25 mm. Specimen forms larger sample , set of weight to give a normal stress of 3 kg/ sq. cm throught large as follows : to gives kg/cm sq.

.05	4 nos
.1	1 nos
.2	1 nos.
.5	3 nos.
1.0	1 nos.

The unit is electrically oprate to given the follows 12 rates of strain 1.25 , .625 , .25 , .125 , .50 , .025 , .01 , .0005 , .002 , .004 , and .0002 mm / min

Accessories : a. dial gauge .01 mm X 25 mm travel gauge with calibration certificate.[IS:27209part13])

b. High sensitively compression providing ring cap 200 kg. fitted with .002 mm dial

0 Triaxial shear test apparatus consisting the follows :

(a) Triaxial Cell. As per 2720(part – XII), For 38 mm dia specimen. Loading pad made of Perspex for 38mm dia specimens Pair of plain discs made of Perspex 38 mm dia 6 mm thick Pair of porous stones 38 mm dia specimen Split sand former for 38 mm dia specimen Sheath stretcher for 38 mm dia specimen One dozen rubber sheaths for 38 mm dia samples For synthetic rubber 'O' rings for 38 mm dia specimen One plastic drainage tube.

(b) Load Frame, Bench type , Motorised, with 3 speed. Two pillar type , Light weight and sturdy , Ideal for using in mobile laboratory also This load frame is designed for conducting unconfined triaxial, CBR and other routine tests. Loading system comprises of a screw jack with a detachable handle. The lower plate moves up and down. The top bracket is adjustable for vertical clearance and has an adapter for connecting stranded proving rings. A dial gauge mounting bracket is provided on one of the two pillars rate of strain: 3 (1.25, 1.50, 2.50 mm/min.) Suitable for operation on 220V 50 Hz single phase AC supply

(c) Bishop Pore Pressure Apparatus for 10 Kg / CM sq The apparatus consists of a panel for wall mounting on which are fitted – 1.0 to 10 kg/cm sq. x 0.1 kg/ cm sq. a pressure gauge, bourdon type 20 cm dia. MANOMETER: Glass u-tube manometer for measuring low positive pore pressures negative pore measures and checking zero error of pressure gauge. It is provided with a mercury trap mercury supplied. Null indicator made out of clear apparent Perspex with mercury trap and cursor to indicate the mercury level BURETTE: 50 ml burette for measuring the volume change in the soil specimen. Pressure pump fitted with four sleeve packed valves Operated by means of a hand wheel on the end of the piston rod which is threaded through the pump cap and gives a smooth, fine adjustment of pressure. Copper coil and water reservoir The unit is tested against leaks upto 10 kg/cm.sq.

(d) Lateral Pressure Assembly. 0-10 kg /cm<sup>2</sup> The apparatus consists of a pressure chamber which has a flanged top cap fitted with a 10 kg/cm<sup>2</sup> pressure gauge and a Schrader valve for pumping in air. Water inlet and drain cock are fitted to the chamber. The foot pump supplied easily develops a pressure of 10 kg/cm<sup>2</sup> complete with connecting pressure hose.

(e) Oil Water Constant Pressure System. Range 0-20 bar (0-20 kg/cm<sup>2</sup>) Steps of pressure 0.5 bar (0.5 g/cm<sup>2</sup>) , Accuracy + 0.5% Electric supply 230 volt, single phase 50 hz, A. C. supply Supplied complete with pressure gauge, flow valves, connecting pressure hose and set of weights to give maximum pressure of 20 bar (20 kg/cm<sup>2</sup>).

(f) Sensitive Volume Change Gauge. A sensitivity of 0.003 ml/mm with the 6 ml volume of the fluid per cycle has been realized by the sensitive volume change gauge. The unit is tested to a pressure of 20 kg/cm<sup>2</sup> and is designed for wall mounting. High sensitivity Proving Ring of 1000 kg travel. [IS:2720(part11&12)]

Unconfined Compression Tester Proving Ring type. Motorised. As per IS : 2720 (Part - X) ASTM T - 208. Comprises a screw operated load frame, cap. 5000 kgf with a gear box and motor drive giving 1.25, 1.5, 2.5mm/min. rates of strain, a pair of cone seating, adaptor for proving ring and strain dial gauge bracket, supplied with one pair of male/female coning tools for 38mm dia samples but without ring and dial gauge, suitable for operation on 230volts single phase A C supply Accessories ; a) High sensitivity proving ring Cap - 200 / 500 / 1000 kgf Dial Gauge 0.01 mm x 25 mm travel. [IS:2720(part10)]
Temperature controlled oven
Liquid limit device motorized
Liquid limit device - hand operated
Plastic limit device -
Permeability Test apparatus - Falling head
Permeability Test apparatus - Constant head
Sand Replacement method device
Digital weighing balance capacity 5 kg

**Hydraulic Lab (1615409) IV SEMESTER**

Sl. No.	Name of Equipment/Instruments/Apparatus
1	Piezometer
2	U - Tube manometer
3	Bourdon's tube pressure Gauge
4	Bernoulli's apparatus with all accessories for the verification of Bernoulli's theorem
5	Reynolds apparatus to study the types of flow
6	Pipe friction apparatus with all accessories to determine the Darcy's friction factor
7	Apparatus required to determine the minor losses in pipes due to sudden expansion/ sudden contraction / bend / pipe fittings .(any two)
8	Apparatus required to determine the manning constant or Chezy's constant in a laboratory flume (rectangular channel section)
9	Study and use of characteristic curves , moody's diagram , nomogram of mannings equation
10	Channel section having sudden change in slope for the formation of hydraulic jump or hydraulic jump apparatus.
11	Apparatus required to determine the coefficient of discharge for a given rectangular triangular notch.
12	Apparatus required to determine the coefficient of discharge for a given venturimeter.
13	Pitot tube
14	Current meter
15	Apparatus to determine the hydraulic coefficients for sharp edge orifice.
16	Model of centrifugal and reciprocating pump.
17	Water meter

**COMPUTER AIDED DRAWING LAB (SUB CODE : 1615410) IV SEMESTER**

Sl. No.	Name of Equipment/Instruments/Apparatus
1	Auto CADD Software
2	Color Printer
3	3D Max Software

**Theory of Structure Lab (1615506) V SEMESTER**

Sl. No.	Name of Equipment/Instruments/Apparatus
1	Behaviour of Column & Struts Apparatus
2	Deflection of Truss Apparatus
3	Two Hinged Arch Apparatus
4	Shear Force, Loading & Bending moment apparatus
5	Strain Gauge Indicator

Deflection of Beam Apparatus
Euler's Buckling load Testing apparatus
Apparatus for determination of moment of Inertia of Flywheel

**Building Services & Entrepreneurship development Lab V SEMESTER**

Name of Equipment/Instruments/Apparatus
Vent Pipe, G.I. Pipe, PVC Pipe, Copper Pipe, C.I. Pipe, A.C. Pipe.
Different types of joints
Pipe fixtures
Sluice valve, Reflux valve, Scour valve, Air Relief valve, Pressure Relief valve, Gate valve, Stop Valve, Self closing valve.
S-Type, P-Type and q-Type Traps

**Environmental Engg. Lab (1615606) VI SEMESTER**

Name of Equipment/Instruments/Apparatus
Turbidity Meter, Range 0 to 1000 ntu, Accuracy of 3% of fsd, variable range tube detector, 230 V mains operated.
Digital PH Meter, Range 0-14 PH , Mv range 0-1999mV , Resolution 0.01 PH and 1 mV , with Temp. Compensation 0-100 deg. C, 230 V AC operated supplied with Electrodes and Stand Clamp.
Fluoride concentration apparatus
Residual chlorine apparatus
Suspended solids, Dissolved solids and Total solids apparatus
BOD apparatus
COD apparatus
Dissolved Oxygen apparatus
Salinity Meter
Beaker
Digital air volume sampler to determine various pollutant in the atmosphere
Ovens (25 – 250 °C)

**Maintenance & Rehabilitation of Structure Lab VI SEMESTER**

Name of Equipment/Instruments/Apparatus
Rebound Hammer with its complete accessories
Apparatus for Non Destructive Test

Principal  
Govt. Polytechnic, Madhepura

**GOVT. POLYTECHNIC, MADHEPURA  
DEPARTMENT OF ELECTRICAL ENGG.**

**1. ELECTRIC CIRCUITS & NETWORK LAB (SUBJECT CODE: 1620306) III SEMESTER**

Sl. No.	Name of Equipment/Instruments/Apparatus
1	D.C. Power supply (12v)
2	Digital Multimeter
3	Stop watch
4	Connecting Leads
5	Alligator Clips
6	Voltmeter and Ammeter of different ranges
7	Wattmeter (0-75 W & 0-150 W)
8	Rheostat of different size
9	Resister, Inductor, Capacitor of different value ( $\Omega$ , k $\Omega$ , mH, MF)
10	1 KVA auto transformer
11	RLC Kit
12	Wires
13	Oscilloscope (Tektronic MDO 3000 Series)
14	AC function Generator

**2. ELECTRICAL MEASUREMENT LAB (SUBJECT CODE : 1620307) III SEMESTER**

Sl. No.	Name of Equipment/Instruments/Apparatus
1	Kelvin's Double Bridge test kit
2	Wheatstone bridge test kit
3	D.C. potentiometer kit with 12v (D.C.) standard cell
4	Temperature transducer kit
5	Transformer oil dielectric strength testing kit upto 30kv
6	1- $\phi$ and 3- $\phi$ energy meter testing kit
7	Ammeter 0-5 & 0-10A Voltmeter 0-300 and 0-600v
8	Rheostats of Various ranges
9	Digital Multimeter
10	Analog Multimeter
11	Wattmeter (0-75w), (0-150w) and (0-350w)
12	Megger
13	Earth Tester

**3. ELECTRICAL WORK SHOP PRACTICE (SUBJECT CODE: 1620409) III SEMESTER**

Sl. No.	Name of Equipment/Instruments/Apparatus
1	Tool Kit (with screw drivers, Alignners, Spanners Tester, Logic Indicator, Stripper, Cutter, Plier
2	Soldering & Desoldering Equipment
3	Electric Iron, Room heater, electric toaster, Water heater, Electric Kettle, Electric Oven, Ceiling fan, Table fan, Fan regulator, Alarm bell for dismantling repairing, assembling and testing purpose, Emergency lamp, Voltage Stabilizer
4	Lamination plates for assembly of small transformer cores
5	Small battery charger for assembly and study purpose
6	Armature core for armature winding of 3- $\phi$ induction motor
7	Armature core for armature winding of car Dynamo
8	5A and 15A sockets
9	Distribution board
10	5A switches, micro switches sockets and wiring accessories (ceiling rose, Holders, junction boxes) pipes for various types of wiring
11	Florescent tube light set with choke
12	Alarm and indicating Relays indicating lights for wiring and testing
13	Cables & Wires

**4. D.C. MACHINES & TRANSFORMER LAB (SUBJECT CODE: 1620406) IV SEMESTER**

Sl. No.	Name of Equipment/Instruments/Apparatus
1	D.C. shunt generator 110v/220v/230v, 8A, 5kw Along with D.C. motor as prime mover.
2	D.C. series generator 110v/220v/230v, 8A, 5kw Along with d.c. motor as prime mover
3	D.C. shunt motor, 3H.P., 220v, 1500 rpm.
4	D.C. shunt motor, 3H.P., 220v, 1500 rpm With mechanical breaking arrangement
5	D.C. series motor, 3 H.P., 220v, 1500 rpm With mechanical breaking arrangement
6	Three point D.C. motor starter
7	Four point D.C. motor starter
8	D.C. voltmeter (0-230v), D.C. ammeter (0-10A)
9	1-φ transformer, 230/230v, 230/115v, 3kva with tapping at 10%, 25%, 50% and 75% housed in steel box with educational type terminals provided with control panel. (for O.C. and S.C. test) consists of the following accessories. a) MCB (16A, 600v) – 1 pc b) Fuse 10A – 1Pc c) Analog Ammeter (0-1A) – 1 Pc d) Analog ammeter (0-5A) – 1 Pc e) Analog voltmeter (0-50A) (0-300v) – 1 Pc each f) Wattmeter 1/2A, 150/300v g) Wattmeter 5/10A, 75/150v h) 1-φ auto transformer (0-270v), 5kVA i) Loading rheostat 1-φ
10	3-Phase transformer 400/230v, Y connected, 10A
11	1-φ transformer 220/110v, 13.62/27.25A, 3KVA

**5. SWITCH GEAR AND PROTECTION (SUBJECT CODE: 1620506) V SEMESTER**

Sl. No.	Name of Equipment/Instruments/Apparatus
1	Experimental kit for overcurrent relay
2	Air circuit breaker trainer kit
3	Minimum oil circuit breaker (MOCB) trainer kit
4	Miniature circuit Breaker (MCB) trainer kit
5	SF6 (sulphur hexa fluoride circuit breaker trainer kit)
6	Vacuum circuit breaker trainer kit
7	D.O.L. starter (for induction motor) trainer kit with overcurrent relay

**6. A.C. MACHINE LAB (SUBJECT CODE: 1620507) V SEMESTER**

Sl. No.	Name of Equipment/Instruments/Apparatus
1	3-Ph Induction motor 400v A.C., 50Hz, 5H.P. 8A, 1400 rpm squirrel cage type with control panel.
2	Study model 3-φ auto transformer starter, 415-470v, 15A for 5HP, 50Hz motor with switching arrangement
3	Study model of D.O.L. starter, 50Hz, 415-470v, 15A for 3HP motor
4	Study model of star-delta starter, 415-470v, 15A for 5H.P motor
5	Tachometer, Stroboscope
6	D.C. shunt motor 3HP, 220v mechanically coupled to 3φ, 440v, 2KVA, alternator separately excitation in built in the panel with control panel having all the necessary accessories.
7	Synchronous motor 3HP, 415v a.c., 3-φ coupled to D.C. shunt generator 230v, 2KW bolted on common base plate with control panel having all necessary accessories to be provided on the panel board.
8	3-Ph Induction motor 400v a.c., 50Hz, 5HP, 8A, 1400 rpm squirrel cage type with control panel and loading arrangement
9	Single phase induction motor 230v, 1HP capacitor start type.

**7. INDUSTRIAL AUTOMATION LAB (SUBJECT CODE: 1620509A) V SEMESTER**

Sl. No.	Name of Equipment/Instruments/Apparatus
1	DC/AC Potentiometer error Detector Trainer Kit (Make Sciencetech 2306)
2	Experimental kit for DC/AC Servomotor trainer kit for the plot of V-I characteristic.
3	Synchro Transmitter/Receiver trainer kit

4	PLC demonstration kit for Lab uses
5	Ac/Dc position control trainer kit.
6	PID controller trainer kit using OPAMPs and R-C circuits
7	20 MHZ Duel Trace Oscilloscope with Probes
8	Function generator with Probes
9	Computer (Latest version CPU)

**8. POWER ELECTRONICS AND DRIVES LAB (SUBJECT CODE: 1620607) VI SEMESTER**

Sl. No.	Name of Equipment/Instruments/Apparatus
1	Thyistor trainer kit for VI characteristic
2	Full wave bridge rectifier trainer kit using SCR and UJT
3	1- $\phi$ parallel inverter trainer kit using SCR
4	1- $\phi$ series inverter trainer kit using SCR.
5	Step up chopper and step down chopper trainer kits with required capacity of (30v/2A and 220v/5A ratings)
6	Circuit breaker trainer kit using SCRs
7	Battery charger experimental kit using SCR
8	Experimental kit for speed control of DC series motor (SCR based)
9	Experimental kit for sped control of induction motor using PWM/CSI inverters
10	20 MHz Dual trace oscilloscope
11	Function generator (100MHz- 2 channel)
12	Regulated Dual DC power supplies (0-64v)

**9. CONTROL SYSTEM LAB (SUBJECT CODE: 1620608) VI SEMSTER**

Sl. No.	Name of Equipment/Instruments/Apparatus
1	D.C. position control trainer kit (servomechanism based)
2	Synchro transmitter and Receiver trainer kit
3	First order system trainer kit
4	Second order system trainer kit
5	Temperature controller trainer kit
6	PID controller trainer kit
7	Computer
8	D.C Power supply
9	Function generator
10	Digital Multimeters
11	Open Loop speed control of D.C. motor set
12	Closed Loop speed control of D.C. motor set
13	Bode plot trainer kit

**10. ELECTRIC TRACTION LAB (SUBJECT CODE: 1620609A) VI SEMESTER**

Sl. No.	Name of Equipment/Instruments/Apparatus
1	Electric AC Locomotive trainer kit/model for study
2	Combined overcurrent and earth-fault relay model
3	Differential relay testing systems
4	Computer (Lattes Version CPU)
5	Software for computer aided Locomotive design
6	Software for Management of electric traction system

**11. MAINTENANCE AND REPAIRS OF ELECTRICAL EQUIPMENT LAB (SUBJECT CODE: 1620609B) VI SEMSTER**

Sl. No.	Name of Equipment/Instruments/Apparatus
1	Tool kit (with screw drivers, Alignners, Spanners, Tester, Logic indicator, stripper cutter, Plier etc)
2	Soldering and Desoldering equipment
3	Electric iron all types
4	Electric oven
5	Electric roasters
6	Electric Fans and regulators
7	Water heater and geysers



8	Mixer and grinder
9	UPS, Inverter, Battery Chargers
10	Air coolers (Portable/Descent type)
11	Semi-automatic and fully automatic washing machine
12	VCD/DVD/AVD Players
13	Microwave ovens

**12. MICROPROCESSOR AND MICROCONTROLLER LAB (SUBJECT CODE: 1620609C) VI SEMESTER**

Sl. No.	Name of Equipment/Instruments/Apparatus
1	8085 Microprocessor trainer kit with data acquisition card
2	8086 Microprocessor trainer kit for study
3	Intel 8051 Microcontroller kit with data card
4	D/A and A/D converters Experimental kit (ADC 0800 series)
5	LED Display kit with card
6	LCD Display kit with card
7	Interface cards for stepper motor and D.C. motor control

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