

GOVT. POLYTECHNIC, MADHEPURA
DEPARTMENT OF MECHANICAL ENGG.

13

1. Mechanics of Solid Lab (Sub. Code-1625306) III SEMESTER

Sl. No.	Name of Equipment/Instruments/Apparatus
1	Torsion Testing Machine- for Wire as per IS : 1717. The number of twists required to fracture a wire sample can be determined rapidly with this machine. Capacity -10 mm
2	Pendulum Impact Tester.- As per IS : 1757 : 1973 and IS:1499-1977 and BS:131 part 2 & 3-1972, IS:1598-1977 and BS: 131 part 1 -1972. Designed for conducting Charpy, Izod & Impact Tension Tests.
3	Brinell Hardness Tester - Suitable for carrying out Brinell hardness tests on Metals and Alloys of all kinds hard & soft , from carbide to Plastics.
4	Rockwell Hardness Tester. Suitable for carrying out Rockwell hardness tests on Metals and Alloys of all kinds hard & soft , from carbide to Plastics.
5	PC Controlled Universal Testing Machine- Capacity - 20 Tons. Complete with standard accessories and Chart recorder
6	PC Controlled Tensile Testing Machine complete with accessories. 20T
7	PC Controlled Compression Testing Machine. electrically cum Hand operated cap. 10 Tons with accessories.
8	Extensometer

2. MANUFACTURING TECH LAB (Sub. Code-1625308 ,1625507&1625606) III/V/VI SEMESTER

Sl. No.	Name of Equipment/Instruments/Apparatus
1	CNC Lathe Machine- Model - PICCO Suitable for the training for Technical institution. Spindle Power : 1 HP, Spindle Taper : MT2 Speed Range : 100 to 3000 rpm Centre Height : 100 mm, Swing Over Carriage : 80 mm Longitudinal Travel : 250 mm Distance between Centre : 250 mm Rapid Travel : 50 mm/ minm, Resolution X Axis: 10 micron, Resolution Z Axis : 10 micron
2	Power Press -. Power Press Capacity 10 Tons , Steel Body with CI Body complete With Electrical Motors and standard accessories
3	Metal Extrusion Machine- 50 grms capacity with a sample Die and complete with Electricals Semi Automatic
4	Cold rolling Die for Steel extrusion with complete fittings
5	CNC Water Jet Cutting
6	Steel Forging Press- capacity 20 KN complete with electrical Furnace & fittings
7	All Geared Lathe- Precision Grade - I. accuracy, 2 HP Motor , with standard accessories, Motor and Electricals Length of Bed - 1350 mm Height of Centre - 175 mm Admit between Centre - 700 mm
8	Norton Gear Box type - V-belt driven precision Grade Heavy Duty Lathe Machine. Supplied with standard accessories, Motor, and Electricals having following specifications ; Distance between Centre - 700 mm ,Length of Bed - 1400 mm, Height of Centre - 175 mm
9	Universal Milling Machine- Motorised Model, V-Belt driven, complete with Standard accessories, motor, pulley and starter Coolant pump. Table Length x Width : 1260 x 280 mm. Longitudinal Traverse : 655mm
	OPTIONAL
	(a) Dividing Head.
	(b) Rotary Table
10	(c) Machine Vice.
11	Heavy Duty Shaping Machine- 18" Stroke V belt driven, complete with motor and electrical
12	Heavy Duty Slotting Machine- V-belt driven Stroke size 8", complete with motor & electrical
	Drilling Machine- V-belt driven with Motor & Electricals
	i) Drilling Capacity 1" Size
13	ii) Drilling Capacity ½" Size
14	Hydraulic Power Hacksaw- V-belt driven, complete with electrical & motor Cutting size : 8" Strokes / minute : 100-120 strokes / minute

15	Vertical Turret Milling Machine- Versatile Turret RAM Milling Machine Heavy duty base, Precision type and swivel head having following Specifications; Table length and Width - 1080 240mm Width of Slots - 16mm Longitudinal traverse - 750mm Cross traverse - 300 mm Vertical Traverse - 400mm RAM Traverse - 300 mm Spindle Bore - H30 Quill Traverse - 127 No. of power Quill Feeds - 3 Feed Rates - mm 0.05, 0.08, 0.15 Motor - 1.5 KW Swivel Milling Head - 45degree either side- 45degree towards column- 45degree away from column, No of Speeds -8 Range of speeds - 70 to 2455 RPM
16	Accumax Tool & Cutter Grinding Machine- Complete with Electricals , Motor, Switches, Grinding wheel and following specifications ;Admit between Centre : 300 mm Swing over Table : 200 mm Table size : 550 x 120 mm Longitudinal Traverse : 250 mm Cross Traverse : 250 mm Top to Grinding spindle Center max.: 267 mm Top to Grinding spindle Center mini.: 100 mm Motor : 1 HP
17	Surface Grinding Machine- Supplied with Electrical, Motor and standard accessory having technical specifications ; Working area of table : 225 x 450 mm Max height from table to grinding wheel : 275 mm Vertical feed graduation : 0.01 mm Cross feed graduation : 0.05 mm Spindle speed : 2800 RPM Size of Grinding wheel : 2 x 13 x 31.75 mm
18	Pedestal Grinding Machine- 1 HP capacity

3. BASIC WORKSHOP PRACTICE (Sub. Code-1601110/ 1602210 I /II SEMESTER

(A) Sheet metal shop

Sl. No.	Name of Equipment/Instruments/Apparatus
1	Hand Lever type Sheet Cutting Shearing Machine. Size 3' capacity to cut 1/16" thick
2	Treadle Operated Sheet Bending Machine 24" capacity
3	Treadle Operated Sheet Shearing Machine 36" capacity
4	Heavy Duty Hand Operated Arbor Press. i) No. 2 Max. Pressure exerted 1 Ton ii) No. 3 Max. Pressure exerted 1 1/2 Ton.
5	I) Vernier Caliper 150mm Outside Imported II) Vernier Caliper 300 mm Outside Imported III) Outside Micrometer 0.25mm Imported IV) Outside Micrometer 25-50mm Imported V) Height Gauge 300 mm VI) Inside Vernier Caliper 150 mm VII) Inside Micrometer 50 mm VIII) Try Square IX) Universal Marking Block
6	Bench Vice Best Quality 4" size.
7	Arc Welding Machine -Oil cooled, current range 40 to 300/350 Amp Supply Voltage 240/415V
8	Spot Welding Machine - 7.5KVA having throat depth 200 - 250mm Water cooled, sheet to be weld. 1.5mm.
9	Gas Welding/ cutting Machine- with cylinder, Regulator Pipes and accessories Complete Set. With O2 and C2 H2 cylinder
10	TIG Welding Machine
11	MIG Welding Machine
12	Projection Welding Machine 5 KVA
13	Seam Welding Machine 5 KVA Capacity

(B) BLACK SMITHY SHOP

1	Black Smith's Hearth or Forge set up of 5 units complete with 5 H.P Air Blower, Motor and fittings.
2	Anvil weight of Anvil 100 kgs
3	Hand hammer. (Cross Peen, Straight Pin, Ball pin Hammer Sizes : 1kg, 5kg, 10kg. 10 pieces each type
4	Double ended sledge Hammer. a) 3kg b) 3 kg

5	Brass Foot Rule
6	Smith's Square or L square
7	Cold set Chisel
8	Hot set Chisel
9	Tongs :
	i. Flat Mouth Tong
	ii. Round Mouth Tong
	iii. Angle Mouth Tong
	iv. Pip Mouth Tong
	v. Pickup Tong
	vi. Side Mouth Tong
	vii. Square Mouth Tong
10	Punch :
	i. Round Mouth Punch
	ii. Square Mouth Punch
	iii. Hexagonal Mouth Punch
	iv. Octagonal Mouth Punch
	v. Oval Mouth Punch
11	Drift.:
	i. Round Mouth Drift
	ii. Square Mouth Drift
	iii. Hexagonal Mouth Drift
	iv. Octagonal Mouth Drift
	v. Oval Mouth Drift
12	Flatter 21/2" x 21/2"
13	Set Hammer 2" x 2"
14	Swage block with stand
15	Top & Bottom swages
16	Top & Bottom Fullers
17	Hardie or Bottom Chisel
18	Gouge (Curve mouth chisel)
19	Stakes (for sheet metal work)
20	Hearth Tools :
	i. Poker
	ii. Rake
	iii. Shovel

(C) CARPENTRY SHOP

1	Jack plane
2	Circular saw machine. Capacity 18"
3	Carpentry vice
4	Exemplifier
5	C. Classer
6	Four fold rule 6" to 15" 2' to 60 mm
7	Try square
8	Bevel square
9	Striper
10	Tenon saw
11	Mortise chisel
12	Wooden gach plane
13	Pincer
14	Ratchet bracket
15	Hand drill
16	Rip Saw
17	Hand saw
18	Compass same

19	Key same
20	Dovetail chisel
21	Wooden carpentry Table size - 21/2 x 51 x 101
22	Planner Machine
23	Drilling Machine
24	Marking Guage
25	Divider
26	Farmer chisel
27	Parking chisel
28	Plane : Trying Plane A - Jack Plane B - Smoothing Plane C - Hollow Plane D - Rabbet Plane E - Read Plane F - Plough Plane
29	Draw Knife
30	Rasp file
31	Nachsch- Wood Turning Lathe Machine. Floor model. Complete with standard accessories i.e. Butterfly center, Dead center, face Plate, Motor, Pulley, Motor mount, Electric motor, Switch, V-belt pulley, having following specifications ; Length of bed : 4 1/2 ' , Bed length : 6 1/4 ft Bed width : 7 " , Height of center : 61/2 '
32	Wooden Band Saw Machine. 18" cutting capacity, Admit between Center : 30 " Spindle speeds : 3Face plate dia : 7 1/2 " , Power : 1HP
33	Wood working machine- Universal type for operations i.e planer, slitting, drilling, etc. six in one
34	Wooden Circular saw machine 12" cutting capacity

(D) FITTING SHOP

1	Dead Smooth Flat file double cut 4"
2	Dead Smooth Flat file double cut 6"
3	Dead Smooth Flat file double cut 8"
4	Dead Smooth Flat file double cut 10"
5	Dead Smooth Flat file double cut 12"
6	Dead Smooth Flat file single cut 4"
7	Dead Smooth Flat file single cut 6"
8	Dead Smooth Flat file single cut 8"
9	Dead Smooth Flat file single cut 10"
10	Dead Smooth Flat file single cut 12"
11	Straight Shank Twist drill bit. Different size ; 1/2" , 3/4" , 1" , 1 1/2"
12	Taper Shank Twist drill bit. Different size ; 1" , 1 1/4" , 1 1/2" , 1 3/4"
13	Fixed Hand Hacksaw frame 12"
14	Adjustable Hand Hacksaw frame 14"
15	Hand Hacksaw Blade 1/2" x 12"
16	Hand Hacksaw Blade 1/2" x 14"
17	Power Hacksaw Blade 1" x 12"
18	Power Hacksaw Blade 1" x 14"
19	Wire Brush
20	Marking Table , 1200mm x 1500mm
21	Steel Rule 14"
22	Hand Drill Power Operated 1/2" Cap. Black & Decker make
23	Measuring instrument steel foot rule 12"
24	Drill Bit, various size (5,7.5,10,12,15,20mm)
25	Power Hexa Blade 12" / 14"
26	Hexa Frame
27	Blade 12"

28	Raw Material M/S Rod (i) 20 mm (ii) Flat
29	Drill Bit- 1/2"
30	Radial drilling Machine. Drilling capacity – 25 mm dia
31	Pedestal drilling Machine. Drilling capacity – 1" dia
32	Surface Plate 24" x 24"
33	Surface plate Table 24" x 24"
34	Micrometer Outside - 100 mm
35	Steel Foot Rule 12"
36	Radius Gauge
37	Filler Gauge
38	Screw Gauge
39	Dial Gauge with stand

(E) FOUNDRY

1	a. Runner pin b. Piser pin
2	Sleek
3	Vent wire
4	Draw pin
5	Draw screw
6	Cleaner & Lifter
7	Molding Box i) Drag ii) Cope iii) Check
8	Swap brass
9	Pin rammer
10	Flat rammer
11	Smooth clay
12	Coal dust
13	Core binder
14	Shovel
15	Local sand
16	Spade (Kudal)
17	crucible 20,40,60,80,100 each one piece
18	crucible tongs different type
19	shank
20	Foundry riddle
21	trowel different type
22	Ladle, each size
23	Cupola furnace
24	Oil fired tilting furnace

(F) PLUMBING SHOP

1	Pipe Vice capacity 4"
2	Pipe Wrench 12"
3	Pipe Wrench 18"
4	Pipe Cutting Dies with Handle. 1/2", 3/4", 1", 1.5", 1.25"

Fluid Mechanics and Machinery Lab.

1	Hydraulic Bench with all accessories
2	Hydraulic Bench to conduct 7 experiments
3	Raynolds Apparatus

4	Reciprocating Pump (with motor) test rig AC motor & Cone pulley type). Specifications ; Pump – 2 cylinder with 1 HP motor & 3 speed pulleys.Sump tank,Measuring tank,Energy meter Pressure & Vaccum gauge,Pressure relief valve. Stop watch with Technical manual.
5	Multi stage Centrifugal pump (Constant Speed) DISCRPTION The test rig consists of a two stage centrifugal pump set suitable for determining its characteristics such as the efficiency and input power at various head and discharge. An energy meter and stopwatch is provided to measure the input power to the pump set. A collecting tank is provided for measuring the actual Flowrate. SPECIFICATIONS :- Capacity – 1HP, with DC motor variable speed type OR Centrifugall Pump – 1HP. With AC motor & Pulley Type S amp tank – 1000 x700x 300 m height, Measuring tank – 600 x 400 x 250 mm height. MEASUREMENT & CONTROL ; a) Energymeter. b) Pressure and vacuum gauges. c) Stop clock. d) Adequate turn pipes and control arrangement e) Equipment – with rust proof powder coating. RANGE OF EXPERIMENTS ;To find out efficiency of a Centrifugal pump Test Rig at various speeds
6	Pelton Turbine Test Rig. A. To demonstrate the operating characteristics (Power efficiency & Torque) of a Pelton Wheel at various operation. B. Determining the performance characteristics and effects of discharge and velocity of impinging water on turbine operation. Supplied with Sump Tank, Centrifugal pump set coupled to 5 HP 3 phase Induction motor, Flowing Measuring Unit, Starter, Piping, Foot valve, Gate valve.
7	Study of Flow Measuring Meters & Instruments
	a)Pitot Tube
	b)U-tube Glass Manometer double column 50 cm
	c)Venturimeter
	d)Piezometer
	e)U-Tube Differential Manometer
	f)Current Meter

THERMAL ENGINEERING LAB

1	Solar Water Pumping System complete with Panels
2	Bio Gas Plant Floating Drum Type
3	Solar Cooker
4	Wind Mill Electric Generator
5	Solar Lantern
6	Solar Street Light
7	Solar Panels various cap
8	Solar water Heating System 100 Ltrs Capacity
9	Thermal Conductivity of Metal Bar. SPECIFICATIONS :- 1) Metal Bar copper - 25 x 430 mm long (approx) 2) Insulating powder shell - 200mm dia (approx) 3) Cooling water chamber - 100mm dia x 75 mm Long (approx) 4) Control Panel Comprising of - a) Voltmeter : 0 - 100/200 volts. b) ammeter : 0 - 2A c) Dimmer stat : : 0 - 240 volts, 2A with 0.1 L.c. using chromelalumel thermo couples couples, cold junction compensation. d) Stop clock, measuring flask for flow measurement.
10	Stefan & Boltzman's Apparatus
11	Model of Shell & Heat Type Heat Exchanger
12	Model of Plate Type Heat Exchanger
13	Model of Cross Flow Heat Exchanger
14	Model of Condensers
15	Model of Evaporators

Theory of Machine and Mechanical Lab. (Sub. Code-1625409)

1	Experimental Set up for Porter Governor With motor /H P. and reduction gear arrangement
2	Barking System
3	Dynamo meter i.) Prony ii.) Rope and Brake dynamometer with prime mover with float belt pulley arrangement

Metrology & Quality Control Lab. (Sub

1	Slip Gauge complete Set
	(a) Vernier Calliper 300mm
	(b) Vernier Calliper 200mm
	(c) Vernier Calliper 150mm
	(d) Inside Vernier Calliper 150mm
2	Sine Bar complete Set
3	Vernier Bevel Protector
4	Straight Edge
5	Gauge Sets (Radius, Thread)
6	Thread Plug Gauges (set of 5)
7	Plain Plug Gauges (Set of 5)
8	Taper Plug Gauges (Set of 5)
9	Thread Micrometer
10	Autocollimator
11	Profile Projector Surface Plate 24" x 24"
12	Magnetic Dial Indicator with Dial Gauge

REFRIGERATION AND AIR-CONDITIONING LAB

1	COMPLETE REFRIGERATION AND A.C TOOL KIT.
2	REFRIGERATION CYCLE TEST RIG
3	Refrigeration cycle test Rig.

Principa
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DEPARTMENT OF ELECTRONICS ENGG.
ANALOG ELECTRONICS/ADVANCE ELECTRONICS CIRCUIT LAB

Sl. No.	Name of article with specification
1	RC coupled single stage FET amplifier
2	RC coupled single stage BJT amplifier
3	BJT Darlington Emitter follower with and
4	BJT-RC phase shift oscillator $f \geq 10$ KHz
5	BJT-Harley and colpits oscillators for RF
6	BJT-crystal oscillators for $f \geq 100$ KHz
7	half wave, full wave and bridge rectifier
8	CKT KR KR verification Thevinin's Theorem
9	CKT KR KR verification of Norton's theorem
10	CKT KR KR verification of leads of transistor

ELECTRONIC MEASUREMENT AND INSTRUMENTATION (SUB. CODE- 1621308,

Sl.No.	Name of article with specification
1	Standard AC bridges kit
2	Frequency Counter
3	VSWR Meter
4	Measurement of displacement using LVDT
5	Anderson's bridge
6	Kelvin's bridge
7	Wien's bridge
8	Maxwell's bridge
9	Digital 5 & 1/2 Digit Multimeter, having ; Diode Test, Buzzer, and Transistor hFE test.
10	Single Trace 10 MHz CRO. MHz
11	Conversion of galvanometer into a voltmeter
12	Strain Gauge
13	Desktop With Printer
14	Dual DC Regulated Power supply
15	Dual Trace CRO, 30MHz with accessories
16	Digital LCR Meter
17	Universal/ LCR Bridge

ELECTRONIC CONSTRUCTION & REPAIR LAB. (SUB CODE-1621406, SEMESTER-4th)

Sl.No.	Name of article with specification
1	Drill Machine drills in the PCB. Supply : 230V AC \pm 10%, 50Hz RPM :
2	PCB Design & Fabrication Complete setup
3	Calculator Trainer
4	Digital Clock Trainer
5	Emergency Light Trainer
6	Fluxing Fan
7	Hot Blower
8	Vacuum Cleaner
9	Tag Board
10	Soldering stand
11	Soldering iron 60 watt.
12	Soldering wire
13	Desoldering Pump
14	20 MHz Anal trace CRO

15	Auto Stabiliser kit for input 110 to 300 V of 1KVA.
16	Radio kit for Demonstration IC based

ELECTRONICS CIRCUIT LAB. (SUB. CODE- 1621407, SEMESTER-4th)

Sl.No.	Name of article with specification
1	Transistor CB and CE configuration kit
2	Fre. Response, of direct- coupled amp. kit
3	Fre. Response of R.C- coupled amp. kit
4	Charac. Of a transformer- coupled amp. kit
5	Push- pull amp kit
6	Charac. curves ,of FET kit
7	Wien bridge oscillator kit
8	Phase shift oscillator kit
9	Operational amp. Complete kit using IC 741
10	Multivibrator Monostable, Biastable)
11	ELECTRONICS DIGITAL MULTIMETER,
12	Q METER. Make:
13	OSCILLATOR TRAINING KITS.
	(a)Hartley Oscillator.
	(b) Colpitt's Oscillator.
	(c)Phase Shift Oscillator.
(d)Version).	
14	AMPLIFIER AND BRIDGE KITS
	(a)Transistor Amplifier Circuits.
	(b) Transistor Push-Pull Amplifier.
	(c) Differential Amplifier.
(d) Multivibrators Using Transistors.	

RADIO & T.V. ENGG.LAB. (SUB CODE- 1621506, SEMESTER-5th)

Sl.No.	Name of article with specification
1	Remote controlled Colour T.V trainer (21")
2	Black & White T.V. trainer (20")
3	Black & White T.V. trainer (14")
4	V.C.R. Trainer
5	Audio CD/VCD/MP3 Player trainer
6	DVD Player trainer
7	LCD Monitor trainer
8	Tuner section of B&W T.V
9	Video I.F. section of B&W T.V
10	Sound I.F. section of B&W T.V
11	Horizontal drive and EHT section of B&W
12	Electronic tuner and EHT section of B&W
13	Electronic tuner section of Colour T.V.
14	Video I.F section
15	Sound I.F section
16	Horizontal oscillator section
17	Vertical Oscillator & output section
18	Horizontal driver and EHT section
19	Switch mode power supply(SMPS)
20	Colour decoder section
21	Video transmitter trainer
22	25" Colour TV with Remote Control