

Electrical Science Lab

S.NO	EXPERIMENT	LIST OF EQUIPMENTS	STATUS
1	To Design the circuit for a given load and selection of its various Components and instruments from the safety point of view	Demonstration Board with Removable Components	Working
2	Study and applications of CRO for measurement of voltage, frequency and phase of signals	CRO-05 DSO-02	Working
3	Connection of lamp by (1)Single Switch Method.(2) Two-way Switch Method	Single way switch-10 2 Way Switch- 10 Lamp with Holder-10 Connecting wires	Working
	Performance comparison of of fluorescent Tube & CFL Lamp	Working Demo Model	Working
5	To Verify Thevenin's & Norton's Theorem OR To Verify Superposition & Reciprocity Theorem. OR To Verify Maximum Power Transfer Theorem	Dual mode power supply-10 Bread Board-10 Resistors (Various Ratings) Multimeter-05 Mili Ammeter-10	Working
6	To Measure Power & Power Factor in a Single-Phase A.C Circuit using Three Ammeters or three Voltmeters	AC Variac-05 Wattmeter-05 Ammeter-05 Voltmeter-05	Working
7	To study of Resonance in a series R-L-C or Parallel R-L-C Circuits.	Variac-05 Choke coil-05 Capacitance box-05	Working
8	To perform open circuit and short circuit test on 1-phase transformer.	Isolation Transformer-04 Voltmeter-05 Ammeter-05	Working
9	Starting, Reversing and speed control of 3-phase Induction Motor	3 phase Induction Motor Demo Panel Setup	Working
10	To Study different types of Storage Batteries & its charging system	Different types of Batteries	Working
11	To Study different types of earthing methods including earth leakage circuit breaker (GFCI)	Demo	Working

**WORKSHOP TECHNOLOGY (ES164)**

<b>S. NO</b>	<b>EXPERIMENTS</b>	<b>LIST OF EQUIPMENTS</b>	<b>STATUS</b>
1	To learn basics of safety precautions to be taken in Workshop safety	1 Fire Extinguisher 2 First Aid Kit 3. Eye Wash Station	Working
2	To study different Machines tools used in Machine Shop (Lathe, Shaper, Planer, Milling and Drilling Machine).	Central Lathe Machine , Circular Band Saw , Lathe , Tool and Cutter Grinder , Centre Less Grinder , Shaper Machine , Planer Machine , Pedestal Drill Machine Milling Machine , Surface grinder , Pedestal Grinder, Steel rule 30 cm graduated both in English & Metric units 16 nos, Outside spring caliper 150 mm , Inside spring caliper 150 mm Hermaphrodite caliper 150 mm. Divider spring 150 mm . Centre Punch 100 mm , Hammer B.P. 0.5 kg. 1. Cold chisel flat 25 x 200 mm , File flat bastard 300 mm , File flat 2nd cut 250 mm . File flat smooth 200 mm 16 nos. Engineers screw driver . Combination Plier 150 mm 16 nos. Safety glasses 16 nos. Surface plate 400 mm x 400mm grade 1 , Table for surface plate 900 x 900 x 1200 mm , Marking off table 1200 x 1200 x 900 mm high , Scribing block universal 300 mm, V- Block 100/7 – 80 – A Try square 300 mm , Outside spring caliper 200 mm , Divider spring 200 mm 2 nos Inside spring caliper 200 mm , Straight edge steel 1 meter 1 no. Straight edge steel 500 mm 1 Steel tape 2 meter in case 1 Steel rule 60 cm graduated both in English & Metric units Sprit level 2V 250, 05 meter 1 Hammer B.P. 800 gms. With handle 30 Screw driver, heavy duty 300 mm with handle	Working
3	To study the tools and machineries used in sheet metal shop		
4	To perform facing and turning operation on a mild steel rod using Lathe Machine.	Central lathe machine	Working
5	Welding shop To prepare lap joint , butt joint , edge joint , corner	- Mild Steel (M.S) flat, Wire brush, chipping hammer, Tongs, Hand Gloves, Welding Screen, Welding Set, Electrode rod, Wire brush, chipping hammer, Tongs, Hand Gloves, Welding Screen, Welding Set,	Working

	joint ,Tjoint	Electrode rod,Wire brush, Chipping Hammer, Tongs, Hand Gloves,Welding Screen, Welding Set, Electrode rod.	
6	To prepare a rectangular tray having dimensions 100x50x20 mm <sup>3</sup> using G.I. sheet	To prepare a rectangular tray having dimensions 100x50x20 mm <sup>3</sup> using G.I. sheet	<b>Working</b>
7	FITTING SHOP a)Introduction to tools in fitting shop b)To make V-Section and T-slot in Fitting shop	Work Holding Devices/ Clamping Tools, Measuring and Marking Tools, Cutting Tools,StrikingTools.,DrillingTools.Threading Tools,Work Bench,BENCH VICE,V Block,Steel rule,Inside Caliper,Spring joint calliper,Odd leg Caliper,Vernier calliper,Micrometer,DEPTH GAUGE,Feeler Gauge,Radius Gauges,Thread Gauge,Wire gauge,Vernier Height Gauge,Try square,Surface plate,Angle plate,Bevel protector,Combination set,Center square.Scriber and surface gauge,Universal markingsurfacegauge,Punches,Divider,Hacksaw,Files	<b>Working</b>

### ENGINEERING DRAWING LAB

SRNO.	EQUIPMENTS	STATUS
1	Drawing board,Drawing sheet Drawing pencilDrawing clips or pinsEraser,Eraser shield, T- square.Set- squares, Large size compass(ii) Small bow compass 'French curve, Large size dividerSmall bow dividerScales, ProtractorsSet-squares	OK

**Digital Logic & Computer Design Lab**

S. No	Experiment	ComponentS Required	Status
1	To Study TTL GATES- AND,OR, NOT,NAND,NOR,EXOR	Bread Board,CONNECTING WIRES,SUPPLY,LED'S, IC-7408,7432,7486	working
2(a)	TO DESIGN AND IMPLEMENTATION OF HALF ADDER AND FULL ADDER CIRCUIT	Bread Board,CONNECTING WIRES,SUPPLY,LED'S, IC-7408,7432,7486	working
2(B)	TO DESIGN AND IMPLEMENTATION OF THE FALF SUBTRACTOR AND FULL SUBTRACTOR	Bread board, CONNECTING WIRES,POWER SUPPLY IC- 7404,7408,7432,7486,7400	working
3	TO DESIGN AND IMPLEMENTATION OF 4-BIT BINARY ADDER	Bread Board,CONNECTING WIRES,SUPPLY,LED'S, IC-7483	working
4	TO DESIGN AND IMPLEMENTATION OF 4:1 MULTIPLEXER AND 1:4 DEMULTIPLEXER	Bread Board,CONNECTING WIRES,SUPPLY,LED'S IC-7404,7408,7432, 74LS153	working
5	TO DESIGN AND IMPLEMENTATION OF 4:2 ENCODER AND 3:8 DECODER	Bread Board,CONNECTING WIRES,SUPPLY,LED'S, IC- 7432,7404,7408	working
6	THE VERIFICATION OF TRUTH TABLE OF S-R,D,T AND JK FLIP FLOP	DIGITAL TRAINER KIT, PATCH CORDS, LEDs, CONNECTING WIRES	working
7	CONSTRUCTION AND VERIFICATION OF 4-BIT RING COUNTER	Bread Board,CONNECTING WIRES,SUPPLY,LED'S, IC- 7474 DUAL D FF	working
8	TO RELEASE 4-BIT ALU	Bread Board,CONNECTING WIRES,SUPPLY,LED'S, IC- 74181	working
9	DESIGN AND COMPUTER ARCHITECTURE. DESIGN A 8085 PROCESSOR WITH MINIMUM NUMBER OF INSTRUCTION	8085 PROCESSOR KIT, KEYBOARD	
10	WRITE AN ASSEMBLY LANGUAGE CODE IN GNU SIM 8085 TO ADD TWO 8-BIT NUMBERS	8085 PROCESSOR KIT, KEYBOARD	

**Circuits & system Lab**

<b>S.NO</b>	<b>EQUIP</b>	<b>QTY AVAILABLE</b>
1.	Function generators	5
2.	Cathode Rays Oscilloscopes	5
3.	D. C. Power Supplies	10
4.	Bread Boards	10
5.	Digital multi-meters	5
6.	Capacitance Boxes	6
7.	Inductance Boxes	6
8.	Resistance Boxes	4
9	MATLAB SOFTWARE	YES

**EVS LAB**

<b>s.no</b>	<b>Class List</b>	<b>Equipment Required</b>	<b>Status</b>
1	Determination of pH and conductivity of soil/sludge samples.	pH Meter Conductivity Meter Measuring Containers Conductivity Cell Stirring Rod	Working
workin	Determination of moisture content of soil sample.	Analytical Balance Drying Oven Aluminum or Glass Dishes Moisture Tins or Pans Spatula or Scoop Brushes or Compressed Air Drying Pans	Working
3	Determination of Total Dissolved Solids (TDS) of water sample.	Analytical Balance Drying Oven Crucibles or Evaporating Dishes Graduated Cylinder or Pipette Filter Paper Conductivity or TDS Meter	Working
4	Determination of Residual Chlorine in the water sample	Residual Chlorine Test Kit Sample Containers Pipettes or Droppers pH Meter Titration Equipment Colorimeter or Spectrophotometer	Working

5	Determination of ammonia in the water sample	Ammonia Ion-Selective Electrode (ISE): pH Meter Calibration Standards Water Sample Containers Pipettes and Burettes Analytical Balance	Working
6	Determination of ammonia in the water sample.	Ammonia Selective Electrode or Test Strips Calibration Standards pH Indicator Glassware and Labware Water Sample Containers	Working
7	Determination of carbon dioxide in the water sample.	Indicator Solution pH Indicator Titration Equipment Water Sample Containers Analytical Balance Calcium Chloride Conductivity Meter	Working
8	Determination of Biological oxygen demand (BOD) in the water sample.	BOD Bottles Dissolved Oxygen (DO) Meter Incubator BOD Analysis Chemicals Burettes and Pipettes Refrigerator pH Indicator Stopwatches	Working

<b>CHEMISTRY LAB</b>		
<b>Experiment</b>	<b>Equipment Required</b>	<b>Status</b>
1. Determination of alkalinity of water sample.	Burette Pipettes Conical Flask Indicator Titration Stand pH Indicator Stirring Rod	Working
2. Determination of hardness of water sample by EDTA method.	Burette and Buret Stand Pipettes Erlenmeyer Flasks Indicator Stirring Rod pH indicator Conical Flask	Working
3. Determine the amount of oxalic acid and Sulphuric acid in one litre of solution, given standard sodium hydroxide and Potassium Permanganate.	Burette Pipettes Conical Flask Indicator Analytical Balance Burette Clamp and Stand	Working
4. Determine the viscosity of a given liquid (density to be determined).	Viscometer Density Measuring Equipment Thermometer Liquid Container Stopwatch Balance Calibration Standards	Working
5. Determine the cell constant of conductivity cell and titration of strong acid/strong base conductometrically.	Conductivity Cell Conductivity Meter Burette pH Meter Stirring Apparatus Titration Setup	Working
6. Proximate analysis of coal.	Muffle Furnace	Working



	Analytical Balance Desiccator Hot Plate Fume Hood Sieves	
7. Determination of the concentration of iron in water sample by using spectrophotometer	Spectrophotometer Reagents Standard Iron Solution Pipettes and Pipette Tips Volumetric Flask Cuvettes	Working
8. Determine the surface tension of a liquid using drop number method.	Liquid Sample Capillary Tube Measuring Scale or Microscope Needle or Dispenser Container or Reservoir Timing Device	Working

**APPLIED PHYSICS LAB**

<b>EXPERIMENT</b>	<b>Equipment Required</b>	<b>Status</b>
1. To determine the wavelength of sodium light by Newton's Rings.	Sodium lamp (light source) Condenser lens Plano-convex lens Glass plate (for creating a thin air film) Flat glass plate (plano-concave lens) Prism (for color separation) Microscope Micrometer (to measure air film thickness) Vernier caliper (to measure ring radius)	WORKING
2. To determine the wavelength of sodium light using diffraction grating.	Sodium vapor lamp Diffraction Grating Collimating Lens Rotating Table or Mount Screen or Detector Ruler or Calipers	WORKING
3. To determine the refractive index of a prism using spectrometer.	Spectrometer Prism sodium vapor lamp Collimator Telescope Adjustable Slits	WORKING
4. To find the wavelength of He-Ne laser using transmission diffraction grating.	He-Ne Laser Diffraction Grating Lens Spectrometer Screen or Detector Ruler and Angle Measuring Device	WORKING
5. To plot a graph between the distance of the knife-edge from the center of the gravity and the time period of bar pendulum. From the graph, find (a) The acceleration due to gravity (b) The radius of gyration and the moment of inertia of the bar about an axis.	Bar Pendulum Setup Measurement Tools (Ruler and Protractor) Knife-edge Pivot Stopwatch	WORKING
6. To verify inverse square law.	Light Source Photocell Measurement Device ruler (Stands, clamps) Wooden bench fitted with scale	WORKING

7. To determine Planck's constant.	Light source Digital voltmeter and ammeter Vacuum photo tube Filters of different colors Photoelectric Cell Variable Voltage Source	WORKING
8. To determine the dispersive power of prism using spectrometer and mercury source.	Spectrometer Mercury Vapor Lamp Prism Collimator Telescope Micrometer Screw Gauge Scale or Vernier Calipers Lab Jack or Optical Bench	WORKING
9. To determine the $e/m$ ratio of an electron by J.J. Thomson method.	Cathode Ray Tube (CRT) Power Supply Magnetic Field Source Scale or Screen Measurement Devices Vacuum System Adjustable Slits or Apertures	WORKING
10. To determine the frequency of A.C. mains by using Sonometer.	Sonometer Tuning Fork Pulley System Frequency Counter AC Mains Power Source Power Supply Meter Scale or Ruler	
11. To determine the frequency of electrically maintained tuning fork by Melde's method.	Tuning Fork Electric Vibrator Frequency Generator Amplitude Measurement Device Mounting Apparatus Measuring Instruments	
12. To study the charging and discharging of a capacitor and to find out the time constant.	Capacitor Resistor Power Supply Switch Voltage Probe or Multimeter Stopwatch or Timer Breadboard or Circuit Board Connecting Wires	WORKING
13. To study the Hall effect.	Hall Probe Magnet Current Source and Ammeter Voltage Source and Voltmeter	WORKING

	Precision Measuring Instruments Adjustable Mounting System	
14. To verify Stefan's law.	Black Body Radiator Temperature Control System Calibrated Thermometer Data Logging Equipment Insulating Materials Radiation Detector	WORKING
15. To determine the energy band gap of a semiconductor by four probe method/or by measuring the variation of reverse saturation current with temperature.	Semiconductor Sample Temperature Control System Four-Probe Setup Thermocouple or Temperature Sensor Amplifier and Signal Processing Equipment Shielding	WORKING
16. To study the I-V characteristics of Zener diode.	Zener Diode DC Power Supply Variable Resistor (Potentiometer) Ammeter Voltmeter Connecting Wires Breadboard or Circuit Board Multimeter	WORKING