

## MSE, Baripada – 757 107

### AICTE APPROVAL PROCESS HANDBOOK

## List of Details Lab/ Workshop Major Equipments

### **1. Fluid Mechanics / Hydraulics Lab**

- a) Francis Turbine test rig
- b) Multi speed Centrifugal Pump
- c) Reciprocating Pump test rig set
- d) Single cylinder 4 stroke Diesel engine with rope brake dynamometer
- e) Models of Centrifugal pump, hydraulic Ram, Kaplan Turbine, Model of Francis, Pelton wheel, Non-Return Valve, Inclined Tube Monometer, Gate Valve, Laser type Digital Tachometer, Digital Tachometer Contact type, Globe valve
- f) Single Cylinder 4 – stroke Petrol Engine Test Rig with rope brake dynamometer
- g) Bernoulli's Theorem apparatus
- h) Orifice Discharge Apparatus
- i) Venturimeter Test Rig
- j) Study of pressure measurement apparatus
- k) Pelton wheel turbine test rig

### **2. Electrical Machine Lab:**

A) All kind of measuring/ testing instruments Electro-dynamometer, Portable type watt Meter, Power factor meter, Voltmeter, Ammeter etc.

B) Single Phase Variac, 3- $\phi$  Variac, Mega Ohm Insulation Tester, High Sensitivity Multi Tester, Digital Multimeter, Clamp meter, Contact type Digital Tachometer, Earth Tester, PF meter, Hand tachometer

C) Complete set of Panel boards with all necessary fittings for running of AC/ DC Motors (Series, Shunt, 3 –  $\phi$  Induction motor with D.C. generator, Compound, 1 phase shaded pole, Repulsion Pole, Capacitor start motor, 3-  $\phi$  slip ring Induction motor, Squirrel cage Induction motor, 3-  $\phi$  Induction motor with Alternator with ROTOR resistance type stator, AUTO TRANSFORMER type stator, DRUM CONTROLLER type stator, Mechanical loading arrangement, Resistive Load Box, Inductive Load Box

D) Energy Meter panel board, Fluorescent Lamp trainer, Safety demonstrator trainer

E) Resistive load box, Inductive load box, capacitive load box

F) Variac with ammeters, Voltmeters, PF meter, watt meter panel board

G) Parallel Operation of Alternators: Complete set up

H) AC ammeter, Voltmeter, 3phase resistive load box

I) Regulated DC power supply,

### **3. (A) Engineering Physics Lab:**

A) Vernier Caliper IME & Wheel type/ Digital type

B) Screw Gauge

C) Spherometer

D) Bar magnet / magnetic compass

- E) Prism
- F) Stop watch (Mechanical / digital racer type)
- G) Rheostat, Voltmeter, Ammeter, Galvanometer, P.O box resistance, Barometer etc.
- H) Regnault's apparatus
- I) Physical balance
- J) Resonance air column
- K) UV method – Meter Scale
- l) Coefficient of Friction apparatus
- m) Weight measurement instrument
- n) Meter bridge
- o) Digital vernier calliper

### 3. (B) Engineering Chemistry Lab:

Marble chips, Hydrochloric Acid, Sulphuric Acid, Nitric Acid, Sodium Hydroxide, Calcium Oxide, Ammonium Chloride, Phenolphthalein Solution, Magnesium ribbon, Litmus Paper (Blue, Red), Nessler's reagent, Ferric chloride, Copper sulphate, Ammonium hydroxide, Sodium Carbonate, EDTA solution, methyl orange, Eriochrome Black – T indicator, Ethyl alcohol, Potassium Permanganate, Mohr's Salt, Ammonia Buffer Solution, Copper turning, Calcium carbonate, Zinc chloride, Magnesium Chloride, Sodium nitrate, Lead nitrate, Potassium Carbonate, Borax, Cobalt nitrate, Charcoal, Lead acetate solution, barium chloride, silver nitrate, Ferrous Sulphate, Iron Sulphide (Broken stick), Ammonium carbonate, Di-sodium orthophosphate, Potassium Pyroantimonate, acetic acid, sodium nitrite, Potassium Chromate etc. are available in the Lab.

#### Apparatus

- |                         |                        |
|-------------------------|------------------------|
| 1. Digital Balance      | 2. Digital PH meter    |
| 3. Kips Apparatus       | 4. Woulf's Bottle      |
| 5. Hard glass Test tube | 6. Burette             |
| 7. Pipette              | 8. Burette stand       |
| 9. Gas Jar              | 10. Test tube stand    |
| 11. Test tube holder    | 12. Test tube brush    |
| 13. White Glazed tile   | 14. Funnel             |
| 15. Motar & Pistol      | 16. Wash bottle        |
| 17. Blow pipe           | 18. Nichrom wire       |
| 19. Blue glass          | 20. Tripod stand       |
| 21. Conical flask       | 22. Arsenic test set   |
| 23. Porcelain basin     | 24. Ton gue            |
| 24. Glass rod           | 25. Delivery tube      |
| 26. Volumetric Flask    | 27. Measuring cylinder |
| 28. Fire Extinguisher   |                        |

### 4. Analog Electronics Lab:

ALL Trainer Test Kits

- a) Semiconductor device characteristics kit
- b) Discrete component trainer board
- c) Free running multivibrator (Astable), Monostable multivibrator with Power supply, Bi-stable multivibrator with Power supply
- d) Display Board for resistors, color coding, potentiometer, capacitor, switches, bend switches, diodes, transistors, and transformer
- e) FET Characteristics (C4)
- f) Transistor Amplifier Types, Two Stage RC coupled amplifier, Class B / C Amplifier

- g) Hartley Oscillator, Wien Bridge Oscillator, Colpitts Oscillator, Phase Shift Oscillator, Tuned amplifier
- h) Analog/ digital multimeters
- i) OPAMP Training Board, OPAMP characteristics & Testing Method
- j) Voltage to Frequency converter, Frequency to voltage converter
- k) Function generator digital display 4 modes 3 MHZ (Model FG 3MA)
- l) C.R.O. (20 MHZ dual trace)
- m) Breadboard system trainer
- n) Digital Multimeter trainer
- o) Transistor characteristics trainer
- p) Universal development platform trainer

### **5. Electronics Measurement Lab:**

Trainer kits in Whetstone Bridge, Maxwell's inductance bridge, Hay's Bridge, Schering Bridge with Decade resistance / inductance/ capacitance box and Lissajous Measurement kit with complete set

### **6. Mechanical Testing Lab:**

- a) Impact Testing Machine FIT – 300 N
- b) Universal Testing Machine (UTM) 10 Ton capacity
- c) Models of Porter governor, Model of steam engine, Model of Hydro-power Installation, Model of vertical water tube boiler, Able's Apparatus, Stefan Boltzman's apparatus, Model of Ammonia ice plant, Models of 2 / 4 stroke diesel /petrol engine, Cochran boiler, Gyroscope Model, Flash & Fire Point apparatus, Boiler models with accessories etc.
- d) Searle's apparatus
- e) Screw Jack
- f) 1) Rockwell hardness Testing Machine  
2) Brinell hardness Testing Machine
- g) Single purchase winch crab, Worm wheel, Fly wheel, Simple supported beam, Train of gear wheel, Bending of Beam apparatus
- h) Refrigeration test Rig
- i) Static & dynamic balancing apparatus/ experimental set up
- j) FTT – 200 NM Torsion Testing Machine
- k) Air Compressor Test Rig (K C Engineer)
- l) Compression testing machine 200KN analog type
- m) Journal bearing apparatus
- n) Governor apparatus

### **7. Computer Lab.:**

(Computational facilities)

Highly configured/ latest hardware Core 2 Duo, P4, i3 processor Computers etc.

Make: Compaq, Wipro, and HCL, assembled

With D-link switch networking, Laser / Color printers (HP), (Cannon) Scanners along with Broadband leased line internet facilities on separate phone numbers.

And List of OS software: MS Windows XP Home, Professional, Application: MS Office 2007 Professional Academic, MS VB.Net (C, C++, DOT NET), Auto CAD 2011 Academic, Kaspersky Internet security, Sreelipi, KiCad, Mathematica & maxima 5.25, Open office 3.3, Adobe Acrobat reader/ flash player) etc.

### **8. Auto Machine Shop & Servicing Lab:**

- a) Demonstration Model of Petrol engine with starting system with Exide battery.
- b) Demonstration Model of Maruti Engine
- c) Cylinder Reboring Machine
- d) Valve Refacing Machine
- e) Bench type Drilling Machine
- f) Models of Ignition system of an Automobile with Distributor, spark plug, coil, switch and Hand operated portable wall hoist
- g) Buffing Machine,
- h) Cell Tester (1000V), Valve seat and face cutter, Battery charger/ Hydrometer, High Rate Discharge Tester
- i) Inside Micrometer, Feeler gauge, Magnetic Base, Vernier caliper, Outside micrometer, Vernier Height Gauge, Dial gauge (0.01 – 25mm, Graduation: 0-100), Valve lifter, Bore gauge
- j) AUTOMOBILE SERVICE STATION set up
- k) Hot path machine
- l) Working Models of Master Cylinder, Brake Cylinder, Shock absorber, Motor Car steering model, Gear box with clutch, Demonstration Differential gear, Rear axle assembly, Hydraulic brake unit, Carburetor SU, SOLEX type, Bush bearing Thrust Bearing, Simple Bearing, Open Truck Bearing, Centrifugal / Multiplate clutch
- m) Car washing Machine with reciprocating Pump
- n) Diesel engine Pump set Generator with starting
- o) Spark Plug Tester & Cleaner ELGI
- p) Air Compressor complete set
- q) Disc brake, fuel supply system of a petrol engine, diesel engine, self-stator, road sign, Lubricating system, cooling systems, electronic ignition system of automobile engine, Diaphragm type clutch assembly, Synchromesh gearbox, Nozzle tester, Hydraulic floor jack, Surface plate, Telescopic gauge, Stud extractor & tap wrench

### **9. Basic Electronics Lab:**

- a) C.R.O. (25 MHz dual trace oscilloscope)
- b) Universal Electronics Trainer
- c) Sine-square Oscillator /Function Generator
- d) Bench type Digital Multimeter / Analog Multimeter
- e) Soldering Station
- f) Display Board for resistors, color coding, potentiometer, capacitor, switches; bend switches, diodes, transistors
- g) Transistor characteristics trainer

### **10. CNT Lab:**

- a) Advance network theorem
- b) RC circuits and time constants / RC LC circuits
- c) Series Resonance
- d) Constant K low pass filter, Constant K high pass filter, Constant K band pass filter
- e) T type attenuator, TT attenuator etc.

### **11. Communication Lab:**

- a) Telephone Demonstrator
- b) Amplitude modulation & demodulation
- c) Frequency modulation and demodulation trainer

- d) Function Generator ST 4061 2 MHz
- e) Fiber Optics Trainer
- f) Microwave test bench MT-9000 (Scientech) complete set

**12. Digital Electronics Lab:**

- a) Trainer Kits on Binary to Gray and Gray to Binary
- b) Study of Flip Flops
- c) 4-Bit Binary Counter
- d) Universal Shift register using
- e) Triple Power Supply
- f) Digital Logic trainer
- g) Digital System trainer
- h) Digital IC trainer
- i) Half/full adder Subtractor
- j) 16-1 Multiplexer, 4-16 demultiplexer
- k) Modulo counter
- l) Shift Register
- m) Analog to digital converter, Digital to Analog converter
- n) Digital IC logic trainer (Model/ TDIT – 002)
- o) CRO
- p) Digital multimeters

**13. Machine Tool / WorkShop:**

- a) Wood cutting Machine with circular Saw
- b) Wooden working lathe with Motor and stator
- c) Air Compressor Machine
- d) Lathe machines
- e) Horizontal Milling M/C (KMC/ HPS)
- f) Bench drilling m/c.
- g) Power Saw m/c
- h) Slotting Machine
- i) Standard Shaper Machine (Crank & Slotted Link Mechanism)
- j) Surface grinder (Horizontal Spindle) HPS/ SAINT
- k) measuring instruments Plug type Sine bar, Dial gauge (Baker), Screw pitch gauge, Thread angle 60°, Taper gauge, S. W. G. wire gauge, Mixed Radius gauge, Combination set, Protractor head, Center gauge, Cylindrical Plug (limit) gauge (GO & NOT GO), Slip gauge (complete set) Calibrated in inch, Vernier Height gauge, Depth gauge, Universal Bevel protector, Combination square Set with 04 no.s loose items, Adjustable Snap Gauge, filler gauge
- l) Arc welding Machine
- m) Gas welding/ cutting Machine
- n) Bench / Sensitive drilling machine
- o) MIG Welding Machine complete set up
- p) All fitting, carpentry, smithy, sheet metal tools are sufficiently available.

**14. Microprocessor Lab:**

- a) 8085 microprocessor trainer (Micro 85 EB II LC)
- b) 8086 microprocessor trainer, Micro 86/88 EB LED
- c) Keyboard and display interface board (VBMB 001)

- e) 2 channel DAC interface board, 8 channel ADC Interface board
- f) 8255 interface board
- g) Traffic Light control system
- h) 8085 Microprocessor Trainer LCD version

**15. Power Electronics and R & TV and Electronics Maintenance Lab:**

- a) Switch Mode Power Supply
- b) Variable Voltage IC Regulator
- c) Low Voltage regulated Power Supply
- d) Thyristor application Trainer
- e) Automatic Voltage Servo Stabilizer
- g) Constant Current type Battery Charger, CVT
- h) C.R.O. (20 MHZ) dual trace oscilloscope
- i) Black & White TV dynamic Demonstrator (Z1)
- j) Color TV Demonstrator (Z2)
- k) A.M superhetrodyne receiver kit
- l) ST 2201 Model DSB/ SSB AM Transmitter Trainer
- m) Analog multimeter trainer
- n) Digital multimeter trainer
- o) AM/FM signal generator
- p) Cassette Player trainer
- q) Transistor radio CRO Dynamic Demonstrator.
- r) Multimedia computer Trainer
- s) Step up chopper
- t) IGBT characteristics and SCR triggering circuits
- u) SCR lamp flasher
- v) Single phase cycloconverter
- w) Mobile Trainer Kit

**16.** Total Numbers of WALL HANGING CHARTS, POSTERS at all Lab. / Workshops

**17.** Total number of TRANSPARENCIES

**18.** Engineering Drawing Models

**19. Language Laboratory:** Supplied by M/s. Orell Techno System India Pvt Limited with license software with hard phones/ web cameras

**20. CIVIL ENGG. LAB.-I**

- 1. IS Sieve
- 2. Weighing Balance
- 3. Vicat's Apparatus
- 4. Le-Chartalie's Apparatus
- 5. Shrinkage – Limit Apparatus
- 6. Los – Angel's Apparatus
- 7. Vibrating Machine
- 8. Impact Test M/C
- 9. Compaction factor Apparatus
- 10. Slump Cone
- 11. Cube Mould
- 12. Flakiness, Elongation test apparatus

### **CIVIL WORK PRACTICE-II**

1. Mini Mixture M/C
2. Trowel, Wooden hammer, Brick hammer, Wooden Float, Kasi, Pick axe, Crow Bar, Spade, Rubber Float, Steel Float, Plumb bob, Water leveling Pipe, Try Square, Brush, Temping Rod, Punch, China dish, Iron Tray, Rice Plate, Cutters, Hack show, Sprit level, Thread, Salty Cap, Safety Shoes, Safety Gloves, Safety Mask.
3. Piles
4. Rod Bender

### **CIVIL ENGG. LAB.-II**

1. Pycnometer
2. Desiccator
3. Core – Cutter with steel Rammer
4. Sieve Shaker M/C
5. CBR Testing M/C
6. Plastic Limit & Casagrande's apparatus for liquid limit.
7. MDD, OMC cylinder with two types of steel Rammer.
8. Penetration apparatus for Bitumen.
9. Flash & Fire Point apparatus for Bitumen.
10. Viscosity testing apparatus
11. Ductility test M/C
12. All types of Container
13. Water Bath
14. Oven

### **SURVEY LAB.-I**

1. Plane table Set
2. Compass (Prismatic & Surveyor Compass)
3. Ranging Rod
4. Offset Rod
5. Arrow, Chain, Tape, Peg, Leveling Bobble
6. Optical Square
7. Eledade
8. Cross staff
9. Tripod stand (Wooden & Aluminum Types)

### **SURVEY LAB.-II**

1. Auto Level
2. Dumpy Level
3. Transit Theodolite
4. Digital Theodolite
5. Wooden staff & Steel Staff

### **21. MACHINE TOOL SHOP & WORK SHOP**

1. Wood cutting machine with circular saw
2. Power Saw machine
3. Capstan Lathe Machine with Accessories

4. Bench Grinding Machine
5. Bench Drilling Machine with Accessories
6. Wood Turning lathe Machine with Accessories
7. Centre Lathe Machine with Accessories
8. Universal Milling Machine with Accessories
9. Surface grinding (Horizontal) Machine with Accessories
10. Slotting Machine with Accessories
11. Standard shaper machine with Accessories
12. Arc welding Machine with Accessories
13. Gas welding (Acetylene) with complete Accessories
14. MIG welding machine (Both Ferrous & Non-Ferrous) with complete Accessories
15. Bench shearing machine with Accessories
16. Working Bench
17. Bench Vice
18. Open hearth furnace with chimney and complete Accessories
19. All machine's cutting tools sufficiently available
20. All cutting tool, hand tool and measuring tools of carpentry shop, Smithy shop, sheet metal shop, fitting shop, welding shop and foundry shop are sufficiently available.
21. Metal cutting (circular grinding wheel) machine.
22. Measuring instrument: Plug type sine bar, Dial gauge with accessories, Screw pitch gauge, Taper gauge, S.W.G. wire gauge, Mixed Radios gauge, Depth gauge, Universal Bevel projector with set, Combination square set, Vernier height gauge, Slip gauge box set, Micrometer outside, Micrometer Depth, Plug gauge (limit), Snap gauge adjust table, Feeler gauge, Vernier caliper, Straight edge, Diamond dressing, Surface plate, Angle plate

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