MACHINES AVAILABLE IN THE LABORATORIES OF DEPARTMENT OF MECHANICAL ENGINEERING

1st Semester

1. Engineering Graphics and Design (ESC102)

2nd Semester

1. Workshop / Manufacturing Practices (ESC104)

A. Lathe machine

- **Following jobs are being done:**
  - **(i) Turning: Reduction of outer diameter of mild steel pin over a specified length**
  - **(ii) Step turning: Further reduction of diameter to make the step of specified length**
  - **(iii) Taper turning: Machining to different size of diameter over a specified length to get the desired taper angle**

(iv) Knurling: To make roughness on the upper surface of pin by Knurling tool

B. Shaping machine

- **Reduction of dimension on length , breadth, height of a 15mm cast iron cube**

C. Drilling machine

- **Making of four numbers hole of 6-10 mm dia on a rectangular piece of mild steel job, spaced at equal distance**

D. Bench Grinding machine

- **Making V-groove on two numbers MS plate**
- **Shaping of tool profile**

E. Welding machine

- **Join two numbers of MS piece on which V-groove has been made**

F. Mould(cop and drag) preparation and Casting

- **Casting of aluminum/zinc for a specified wooden pattern**

3rd Semester

1. STRENGTH OF MATERIALS (ME1308-P)

A. Tensile test

- **Tensile test of mild steel, aluminum, brass, copper, brass made test piece has been done using the apparatus**

B. Compression test

- **Compression test of concrete blocks has been done by the apparatus**

C. Torsion test

- **Torsion test of mild steel rods has been done by the apparatus**

D. Impact test

- **Impact test of mild steel**

E. Brinell Hardness Test

- **Hardness test of steel, copper and aluminum**

F. Vicker's Hardness test

- **Hardness test of steel, copper and aluminum**

G. Rockwell Hardness Test

- **Hardness test of steel, copper and aluminum**

2. Applied Thermodynamics Lab (ME1310-P)

A. Cochran Boiler

- **Different components of Cochran Boiler are being compared with the text book and understood**
- **Vertical boiler that's why occupies less space and portable**

A. Babcock Boiler

- **Water tube boiler components are being illustrated to the students also by comparing from text book.**
- **The specifications are being explained to the students**

B. Lancashire Boiler

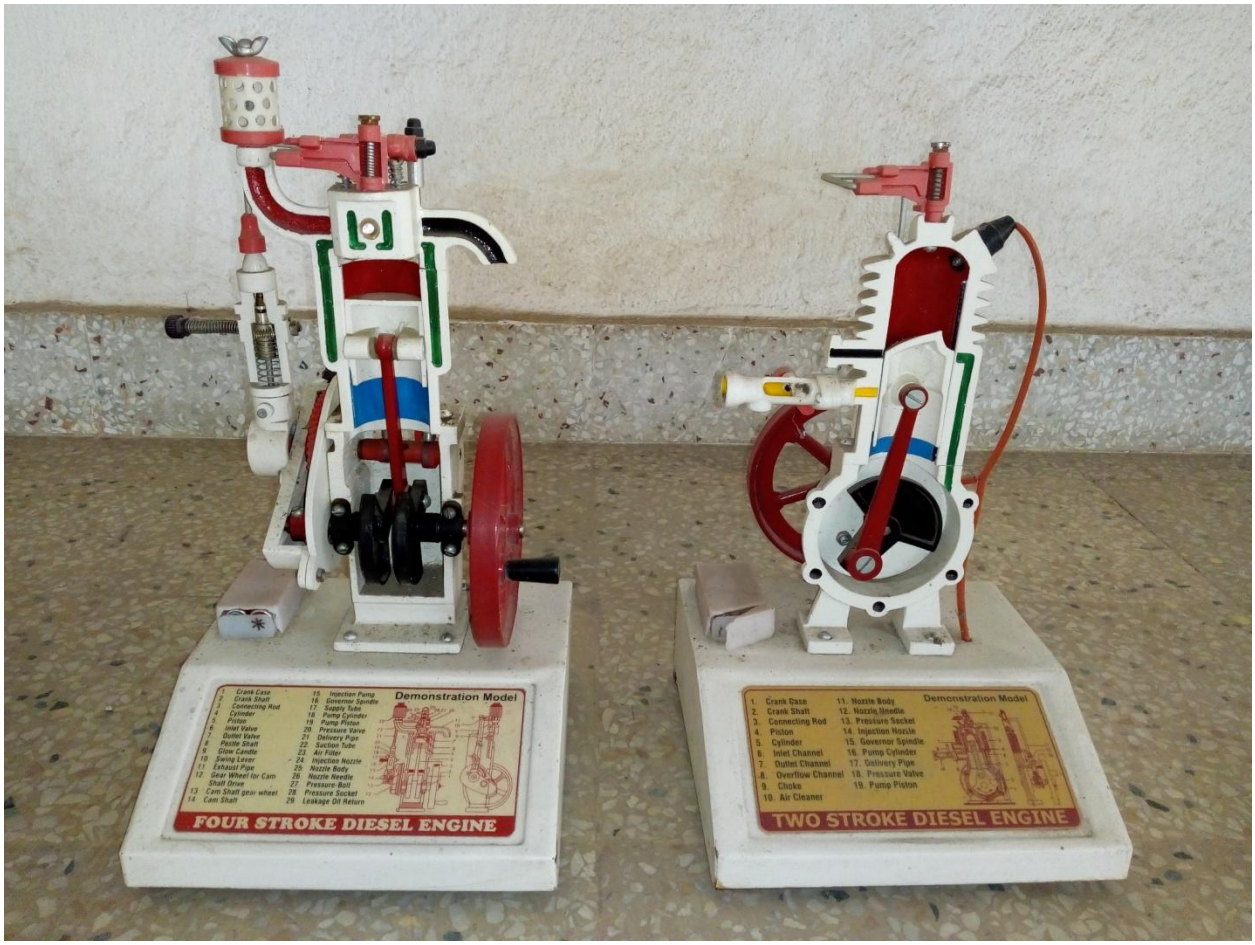
- **The components of the fire tube boiler are being explained to the students along with the constructional details and also the differences with water tube boiler.**
- **Specifications are being explained.**

C. 2 Stroke and 4 Stroke Petrol Engine

- **Working principle of both the types of engine and nomenclature of the components are being explained with help of manually operated models**

D. C.I. Engine

- **Study the compression ignition engine**

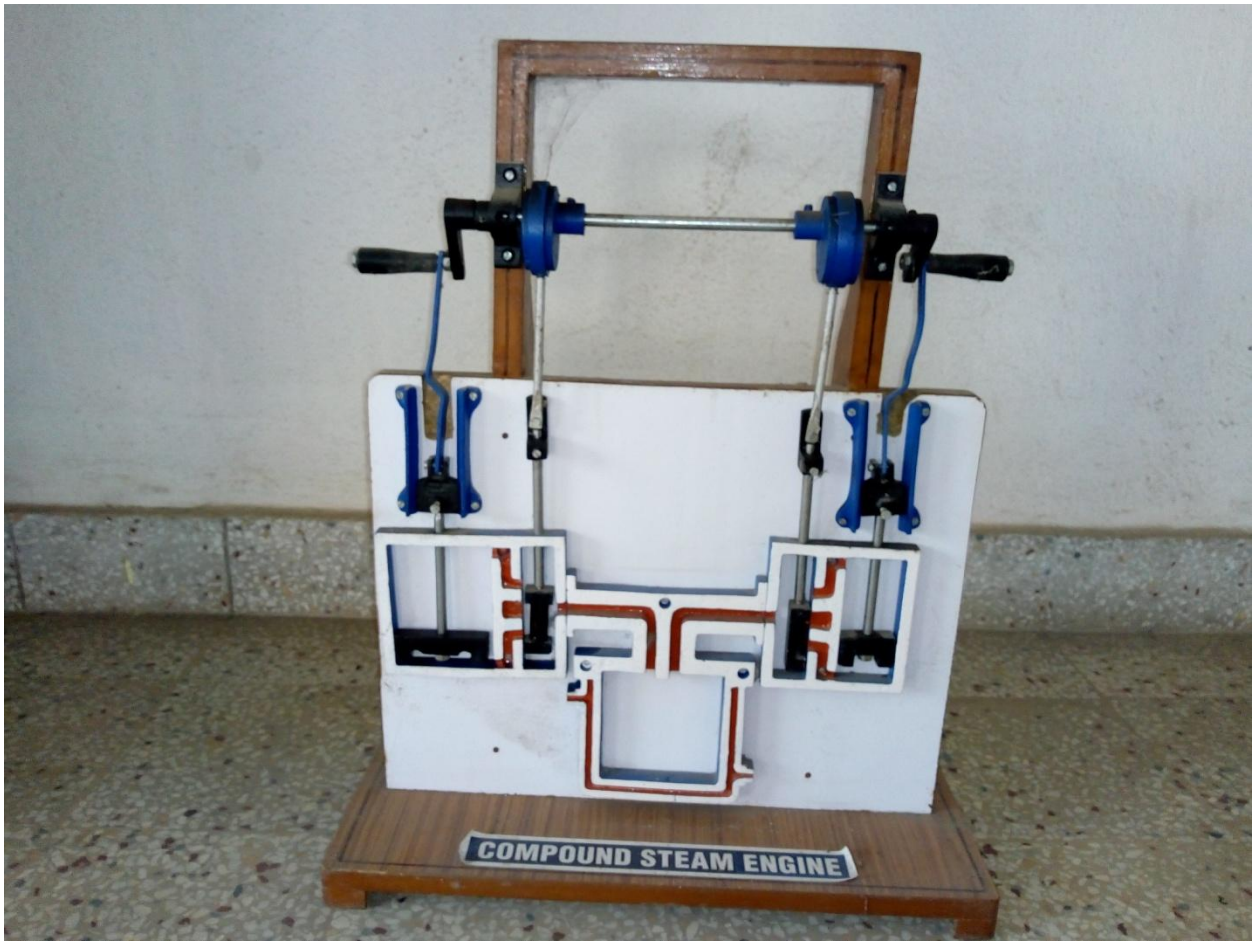


E. Simple Steam engine

- **Study of simple steam engine**

F. Compound Steam Engine

- **Study of compound steam engine**



3. FLUID MECHANICS LAB

A. Bernoulli's Theorem Apparatus

- **Based on energy conservation between two sections**
- **Verification of Bernoulli's equation**

B. Venturimeter Apparatus

- **Measures co-efficient of discharge of flowing fluid in the pipe**
- **Based on conservation of energy and mass**

C. Pipe Friction Apparatus

- **Measures friction factor in different material's pipe with different diameters in turbulent flow**
- **Used different materials are Grey Cast Iron and Mild steel**

D. Pipe Bend Apparatus

- **Measures minor losses like due to sudden enlargement, sudden contraction, pipe fittings, bend etc of flowing fluid in pipe**

E. Orificemeter Apparatus

- **Measures co-efficient of discharge of flowing fluid in the pipe**
- **Based on conservation of energy and mass**

F. Metacentric Height of a Boat Model

- **Measures metacentric height of boat model**
- **Works on Archimedes's principle**

G. Reynold's Law Apparatus

- **Shows the difference between Laminar flow , Transition flow and Turbulent flow based on Reynold's number**

H. Capillary Tube Apparatus

- **Finds the surface tension of given fluid using capillary tubes and travelling microscope**

4. Material Science Lab (ME1307-P)

A. Optical Microscope

- **To study the microstructure of polished material**
- **Used for viewing the grain structure of any metal at high magnificence and watch if any defects occur.**

B. Double Disc Polishing Machine

- **The Material sample is made smooth by means of rotating polishing agent and it is free from any type of scratch.**

C. Belt Grinder

- **The sample is polished on dry and wet belt grinder which gives polished surface but a lot of scratch is present in it which will be further removed by rotating polishing machine.**

D. Muffle Furnace

- **Heat treatment is done by keeping the sample inside the furnace**

E. Jominy Quench Machine

- **The sample is quenched after taking out from the muffle furnace for proper heat treatment.**

4th Semester

1. Mechanical measurements and metrology lab (ME1406-P)

A. Measuring instrument gauges

- **Measurement of angle using Sine bar**
- **Measurement of precise length using Slip Gauge**

B. Strain Gauge trainer

- **Measurement of strain**

C. Surface roughness tester

- **Measurement of surface roughness of given work piece**

D. Pressure gauge trainer

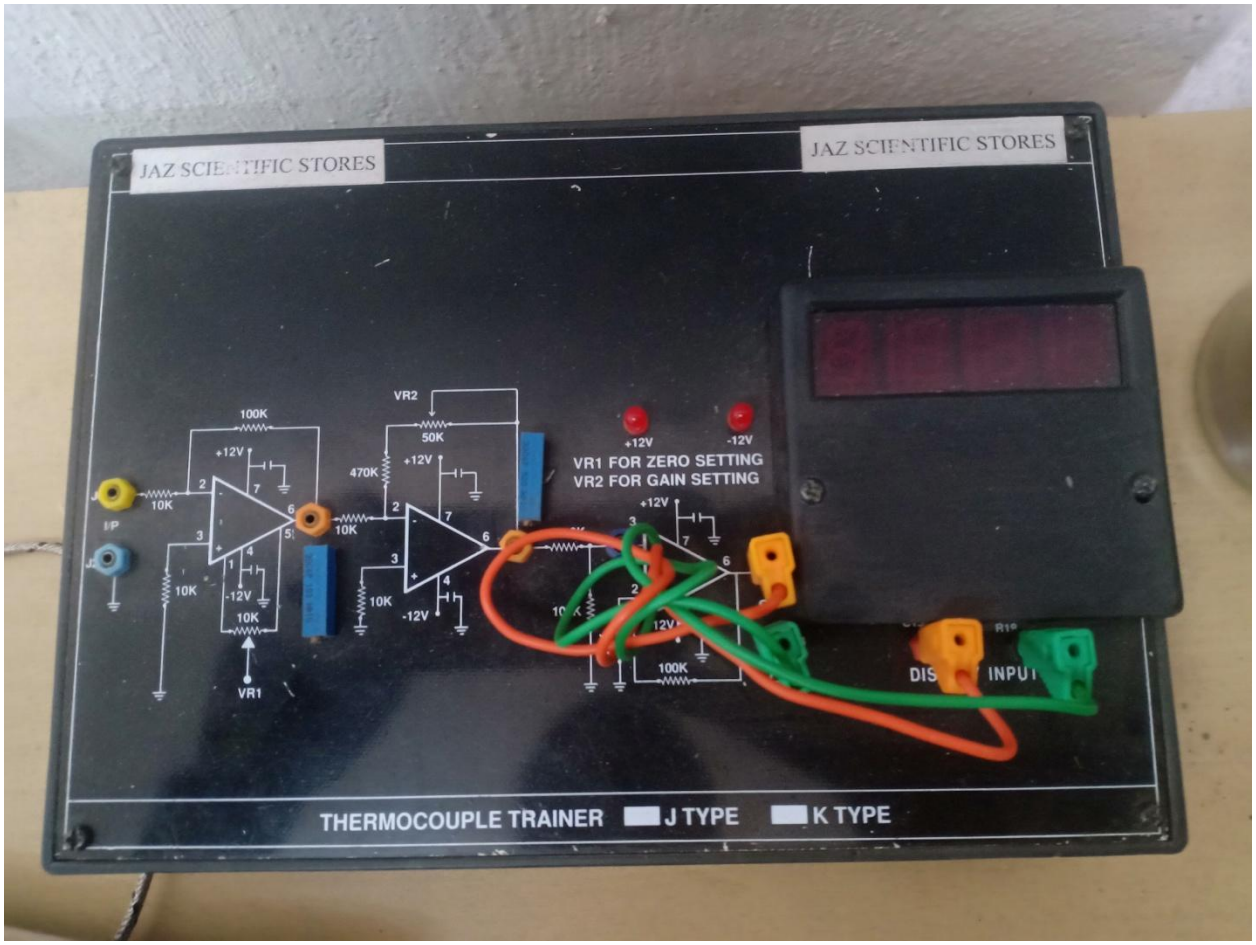
- **Caliberate the given pressure guage**

E. Temperature transducer trainer

- **Study this temperature measuring device**

F. Thermocouple trainer

- **Calibration of thermocouple**



2. Manufacturing science 1 lab (ME 1408-P)

A. 5KVA aluminum melting furnace

- **To make a solid pattern casting of aluminium**
- **To make a hollow pattern casting of alloy**

B. Lathe machine and Shaper machine

- **To make Hexagonal nut with threading**


SHAPING
MACHINE

5th Semester

1. Dynamics Of Machine Lab ME 1508-p

A. Vibration measuring instrument

- **Study and use of vibration measuring instrument**

B. Whirling of shaft

- **Determination of critical speed of given shaft**

C. Fatigue testing machine

- **Study fatigue testing machine**
- **Determination of number of cycles at which a material fails**

2. Heat and mass transfer lab (ME 1511-P)

A. Thermal conductivity apparatus

- **Measures the thermal conductivity of given metal bar**

B. Stefan Boltzman apparatus

- **Measures the Stefan Boltzman constant**

C. Natural convection apparatus

- **Measures the heat transfer co-efficient in natural convection**

D. Parallel and counter flow apparatus

- **Measures the log mean temperature difference of parallel and counter flow of flowing fluid**

E. Emissivity apparatus

- **Measures the emissivity of given grey body with respect to black body**

F. Composite wall apparatus

- **Measures the thermal conductivity and thermal resistivity of composite wall**

3. Computer Aided Drafting (ME1510-P)

4. Manufacturing Science-II Lab (ME1509-P)

A. Lathe Machine

- **Boring and Thread cutting**

B. Milling machine

- **To make T-slot**

C. Shaping machine

- **To make V-groove on given cast iron cube**

D. Surface grinder machine

- **Polishing of mild steel and aluminum work piece**

E. Grinding machine

- **Tool grinding**

6th SEM

1. IC Engine Lab (ME1607-P)

A. Two stroke petrol engine

- **Determination of BHP, Fuel consumption, efficiency, air consumption**

B. Four stroke petrol engine

- **Determination of BHP, Fuel consumption, efficiency, air consumption**

C. Four stroke diesel engine

- **Determination of BHP, Fuel consumption, efficiency, air consumption**

D. Reciprocating air compressor

- **Determination of various types of efficiencies like volumetric efficiency, mechanical efficiency etc.**

E. Two stroke S.I. engine

- **Determination of thermal efficiency and heat balance**

F. Four stroke S.I. engine

- **Determination of thermal efficiency and heat balance**

2. Fluid Machinery Lab

A. Impact of Jet Apparatus

- **Verification of momentum theory**

B. Impulse turbine

- **Determination of operating characteristic**

C. Reaction turbine

- **Determination of operating characteristic**

D. Reciprocating pump

- **Determination of operating characteristic**

E. Air blower

- **Determination of operating characteristic**

F. Air compressor

- **Determination of various types of efficiencies**

3. Refrigeration & Air Conditioning Lab

A. Vapor compression refrigeration system -01

- **Measurement of COP and efficiency**

B. Vapour compression refrigeration system -02

- **Measurement of COP and efficiency**

C. Vapor compression refrigeration system -03

- **Measurement of COP and efficiency**

D. Air conditioning system

- **Measurement of COP and air flow rate**

7th Semester

1. Numeric Control of Machine Tools and robotics

A. Robotic Arm

- **Measurement of joint velocities of robotic arm**

B. CNC milling centre and CNC turning centre

- **Development and machining of irregular shapes**

2. Automobile Engineering Lab (ME1706-P)

A. Steering system

- **Study the steering system**

B. Ignition system

- **Study of ignition system**

C. Transmission system

- **Study of transmission system**

D. Suspension system

- **Study of suspension system**

E. Braking system

- **Study of hydraulic braking system**

F. Lubrication system

- **Study of lubrication system**

G. Cooling system

- **Study of cooling system**

H. Chassis

- **Study and analysis of Chassis system**