

# Details of Laboratory

## Strength of Materials Laboratory

Strength of materials is one of the core subjects in mechanical engineering. It is the physical science that looks at the reaction of a body to movement and deformation due to mechanical, thermal and other loads. In Strength of Materials Virtual Laboratory, students will have the opportunity to apply loads to various materials under different equilibrium conditions. The student will perform tests on different materials in tension, compression, torsion, bending, and buckling, etc. These conditions and/or constraints are designed to reinforce classroom theory. By performing required tests in this virtual lab, students get a near practical feel of the experiment. Student can analyze subsequent data, and compare the results with theory. Viva voce and Practical examination are conducted at the end of the each lab to test the understanding of student.

### List of Major Equipments:

1. Compression testing machines
2. Strain Gauge
3. Torsion testing Machine
4. Beam Deflection Test Apparatus
5. Universal Testing Machines
6. Brinell Hardness Testing machines
7. Specimen cut off Machines
8. Rockwell Hardness Testing machines
9. Impact testing machines
10. Compression Testing Helical Spring
11. Muffle Furnace
12. Wood Testing Machines
13. Fatigue Testing Machines
14. Metallurgical microscope
15. Erickson Testing Machines
16. Disk Polishing Machines
17. Belt grinding Machines
18. End quenching machine
19. Shore Hardness tester
20. Longitudinal compress meter
21. Dial gauge range 0.10mm. L.C.0.01mm. 2 No
22. Le-Chatlier Apparatus along with flask. 6 no
23. Mortar cupe moulds size. 70.6mmx70.6mmx70.6mm. 10No
24. Cube mould size 150mmx150mmx150mm. 6 No
25. Beam mould size. 700mmx150mmx150mm. 2 No
26. Water bath size 300mmx250mmx100mm (6 holes of 75mm dia)
27. Vicats apparatus
28. Cylindrical mould size 150mmdiax300mm height. 6 No
29. Rusetle strain gauge.



Strength of Materials



Impact Testing Machine

### **Engineering Practices Laboratory:**

This lab focuses on the basic mechanical and civil practices. Students are trained in making various joints using carpentry tools and welding. Operations like Machining, Drilling are also taught in this lab. Students are also trained in making pipe connections using plumbing tools.

### **List of Major Equipments:**

1. Bench drilling machine
2. Bench Grinding machine
3. Anvil-Small
4. Anvil-Big
5. Manual Shearing Machine
6. Swage Block
7. Welding Transformer
8. Furnace
9. Pump 1/4 hp
10. Injection moulding machine
11. Oxygen Cylinder
12. Acetylene Cylinder
13. Rotary Hammer
14. Demolish Hammer
15. Circular Saw
16. Planner
17. Hand drilling Machine
18. Jig Saw
19. Angle Grinder

### **Thermal laboratory-I (Heat Engine Lab)**

This Laboratory provides students the opportunity to experience hands on training on performance testing of all types of internal combustion engines(I.C. Engines) like single cylinder, two cylinder and multi cylinder gasoline and diesel engines. They can also do experiments on a working steam power plant which includes performance test of boilers and steam turbines. The lab also had air blowers, air compressors ,fuel property testing equipments and wind tunnel for doing experiments. The lab also had facility to conduct experiments to find performance and energy consumption of refrigeration systems and air conditioning systems.

### **List of Major Equipments:**

1. Four stroke petrol engine cut section model
2. Two stroke petrol engine cut section model
3. Four stroke diesel engine cut section model
4. Multi cylinder petrol engine test rig
5. Twin cylinder diesel test rig
6. Single cylinder diesel test rig
7. Electrical steam turbine test rig
8. Two stroke petrol test rig
9. Wind tunnel test rig
10. Air conditioning test rig
11. Centrifugal blower test rig
12. Cleave land flash & fire point apparatus
13. Two stage air compressor test rig
14. Universal say bolt viscometer
15. Vapour compression
16. Refrigerator test rig
17. Red wood viscometer
18. LPG Refrigerator test rig

### **THERMAL ENGINEERING LABORATORY**

Students are observed, feel and understand the science of heat transfer with our Heat transfer lab. Budding technocrats need to familiarize with all 3 modes of heat transfer - conduction, convection and radiation. Heat Transfer lab not only ensures easy understanding of the processes, but also gives an insight onto the concepts of heat exchange. These experiments also pave way for inculcating innovative skills in the students. Our experimental setups are a starting point to take up higher-level experimental studies in heat transfer.

### **List of the Major Equipment:**

1. Thermal conductivity of insulating material apparatus
2. Heat transfer through composite wall apparatus
3. Heat transfer from a pin fin apparatus
4. Heat transfer by natural convection apparatus
5. Heat transfer by forced convection apparatus
6. Emissivity measurement apparatus
7. Heat exchanger (parallel flow & counter flow) apparatus
8. Stefan Boltzmann apparatus
9. Thermal conductivity by Guarded hot plate apparatus
10. Water cooling tower apparatus
11. Lagged pipe apparatus
12. Fluidised bed cooling tower



## **Manufacturing Technology Laboratory:**

This lab provides students with an experience of various operations that can be performed in Lathe, Shaper, Drilling, Milling Machines and other special purpose machines, enabling the Students to gain practical knowledge required in Core industries for manufacturing different components.

### **List of Major Equipments:**

1. Light Duty Centre Lathe
2. Medium Duty Centre Lathe
3. Capstan Lathe
4. Cylindrical Grinding Machine
5. Bench Grinding Machine
6. Surface Grinding Machine
7. Centreless Grinding Machine
8. Shaping Machine
9. Milling Machine
10. Radial Drilling Machine
11. Pillar Drilling Machine
12. Planing Machine
13. Slotting Machine 6"
14. Slotting Machine 12"
15. Gear Hobbing Machine
16. Power Hack Saw Machine
17. Lathe Tool Dynamometer
18. Milling Tool Dynamometer
19. Tool And Cutter Grinder
20. Gear Shaping Machine



## Fluid Mechanics & Machinery Laboratory:

The laboratory provides an understanding about the working of flow measuring equipments and hydraulic machines like pumps and turbines etc. Students practically will determine the flow properties using flow measuring equipments. They also will be able to determine the performance characteristics of pumps and turbines. Cut-Section models of pumps are also available so students can get better understanding of the construction.

### List of Major Equipments:

1. Orifice Meter
2. Venturi Meter
3. Rotometer
4. Centrifugal Pump
5. Submersible Pump
6. Reciprocating Pump
7. Gear Oil Pump
8. Kaplan Turbine
9. Francis Turbine
10. Pelton Wheel Turbine



## CAD/CAM Laboratory:

This laboratory is available for the development of designs utilizing both 2D and 3D Software. The lab is available to graduate students in the Department of Mechanical Engineering. Student technicians are available to assist in the Computer Aided Design (CAD) package has three components: a) Design, b) Analysis, c) Visualization. Specially trained graduate students with a strong understanding of the Computer-aided design (CAD) is the use of computer systems to assist in the creation, modification, analysis, or optimization of a design and Computer-aided manufacturing (CAM) is the use of computer systems to plan, manage, and control the operations of a manufacturing plant through direct or indirect computer interface with plant's resources.

### CAD/CAM LAB Equipment & Software's

- Ansys 14
- Pro Engineering Wildfire 5.0
- CATIA V5
- Auto CAD 2011
- LCD Monitor Computers
- HP Printers



- CNC Trainer Lathe
- CNC Trainer Milling Machine
- CNC Trainer Turning Machine



### **Automation and Metal Forming Laboratory:**

This lab provides students to have hands on experience on basic metal forming processes and to determine some metal forming parameters for a given component. Students impart practical knowledge on bulk metal forming and sheet metal forming processes.

List of Major Equipments:

1. Water hammer forming
2. Extrusion machine
3. Stir Casting Machine

