DEPARTMENT OF MECHANICAL ENGINEERING

LAB DETAILS & LAB MANUALS

1. WORKSHOP

Mechanical Workshop is broadly divided into five shops such as **Carpentry**, F**oundry, Fitting, Metal Joining and Machine Shop.** This Lab comprises of various machine such as:

Lathe machines	Casting Mould box
CNC Lathe Machine	Casting Patterns
Grinding Machine	Power Hammer
Drilling Machine	Wire Drawing Machine
Shaper machine	Power Hacksaw
Universal Milling machine	Bench Vices
Tungsten inert gas *(*TIG*)* welding	Sample Plate
Oxy acetylene gas welding	Electric Arc welding set-ups are available in the workshop.
Induction Furness	HMT make T-70 CNC training machine with colour monitor is also available in the workshop.(for demonstration purpose)

Manual of Fitting & Welding

Manual of Machine shop

2. ENGINEERING GRAPHICS LAB

This Lab comprises of various cut section models such as

LCD Projector	Bush Bearing	Gib & Cotter Joint
Interactive Board	Plumber Block	Sleeve & Cotter Joint
Over Head Projector (OHP)	Foot Step Bearing	Socket & Spigot Joint
Models of Ball Bearing	Keys	Universal Coupling
Roller Bearing	Rivet Joints	Hook's coupling
Taper Bearing	Knuckle Joint	Flexible Coupling
Thrust Bearing	Tie Rod Joint	Muff Coupling
Open Truck Bearing	Cotter Joint	Oldham's coupling
Simple Bearing	Foot step bearing	Locking Arrangement of Bolts
Transparent Wooden Model of Prism and Pyramid for demonstration purpose. It also has Drawing Boards, Drawing File Cabinet etc.		

3. APPLIED THERMODYNAMICS LAB

This Lab comprises of various apparatus such as

Babcock and Wilcox boiler	Impulse & Reaction Turbine
Gas turbine	Steam Engine
Locomotive Boiler	Two Stroke Petrol Engine
Cochran boiler	Four Stroke Petrol Engine
Lancashire Boiler	IC Engine Test rig, Gas Turbine
Refrigerator	Two Stroke Diesel Engine
Velocity Compounded Steam Turbine	Four Stroke Diesel Engine
Pressure Compounded Steam Turbine	Ignition System of I.C. Engine
Breaking System Gas Turbine models etc.	

Manual of Applied Thermodynamics Lab

4. MATERIAL SCIENCE LAB

This Lab comprises of various apparatus such as

Shear test attachment	Muffle Furnace
Universal Testing Machine (40 Tones) with computer attachment	Vickers Hardness Tester
Torsion Testing Machine	Microscope
Vibrating testing machine	Belt Grinder Machine and Single Wheel Polishing Machine
Optical Microscope	Fatigue testing machine
Fatigue testing machine	Polishing Machine
Spring testing machine	Impact Testing Machine
Creep testing machine and spring testing machine for spring index testing etc.	

Manual of Material Science Lab

5. FLUID MECHANICS LAB

This Lab comprises of various apparatus such as:

Meta centric height Apparatus	Discharge through venturimeter & Orifice meter
Reynolds Apparatus	Discharge over notches
Flow through Orifice and Mouth pieces	Losses due to pipe fiting, sudden Bend Meter test Rig
Bernoulli's theoram apparatus	Loss due to friction in pipe lines
Electrical Analogy apparatus	

Manual of Fluid Mechanics Lab

6. THEORY OF MACHINES LAB

This Lab comprises of various apparatus such as:

Universal Governor Apparatus	Static & Dynamic Balancing Apparatus
Whirling of shaft apparatus	Cam Analysis Apparatus
Motorized Gyroscope Apparatus	Journal Bearing Apparatus

Manual of Theory of Machines lab

7. MANUFACTURING SCIENCE -LAB

This Lab comprises of various apparatus such as:

Tube Bending machine	Dies (die size 9mm, 8.5mm, 8mm, 7.5mm)
Jigs & Fixtures & Holes	Punching machine Capacity 5 Tox
Trinocular Metallurgical Microscope (M4X, M10X, M40X, M100 (oil) Magnification (25x-100x))	Induction Furnace (capacity up to 1 kg.)
Fly Pres (Screw size 75 mm dia.) O single slided	Injection moulding machine (capacity 100 gm. plastic granual)
Strip Rolling Machine (Rolling Capacity 20mmX5mm Strip) Ralle's length 4.5", Dias at Rolle's 2.5".	Power hammer
Wire drawing Machine (Drawing Capacity 3mm)	surface grinding machine
Single die system, wire stand pull-intong havells make 5HP motor	4" fully automatic torrent lathe etc

Manual of Manufacturing Science Lab

8. MEASUREMENT METROLOGY AND CONTROL LAB

This lab is consisting of various models such as:

Dial Indicator	Filler gauge
Limit Gauge (study of limit gauge range 12 mm)	3 Wire Set
Surface Plate (1000x630mm) with stand	Micrometer (Make Mitutoya), Capacity 0-25 mm (a) Digital display (b) Slandered LC 0.001 mm
Vernier Caliper, (Make Mitutoya), Capacity 0-15 mm, (a) Digital display (b) Gear tooth Vernier.	

Manual of Measurement Metrology And Control Lab

9. FLUID MACHINE LAB

This Lab comprises of various apparatus such as:

Impact of Jet on vanes	Hydraulic ram test Rig
Pelton turbine test Rig	Reciprocating pump test Rig
Francis turbine test Rig	Centrifugal pump test Rig
Kaplan turbine test Rig	Gear pump test Rig.

Manual of Fluid Machine Lab

10. HEAT AND MASS TRANSFER LAB

Heat & mass transfer lab is well equipped with following setups like:

Heat transfer through composite wall	Heat transfer from pin-fin
Heat transfer through lagged pipe	Steffen Boltzmann apparatus
Pool boiling apparatus	Emissivity measurement apparatus
Heat transfer in natural connection	Parallel/counter flow heat exchanger
Thermal conductivity of insulating power	

Manual of Heat and Mass Transfer Lab

11. I.C. ENGINES LAB

This Lab comprises of various apparatus such as:

Single cylinder - 4 stroke diesel engine test rig
Single cylinder - 4 stroke petrol engine test rig
Four cylinders - 4 stroke petrol engine test rig
Battery Ignition System etc.

Manual of I.C. Engine lab

12. REFRIGERATION AND AIR CONDITIONING LAB

This Lab comprises of various apparatus such as:

Refrigeration test rig
Cut section bord of RAC
Components and control
W|indow type air conditioning test rig
Ice plant Trainer.

Manual of Refrigeration and Air Conditioning lab