MARTHANDAM COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

METROLOGY AND MEASUREMENTS LABORATORY

Major Equipments Available in the Lab

Sl.No	Name of the Equipments	Specification	Quantity
1	Micrometer	(0-25 mm)	2
2	Micrometer	(25-50 mm)	2
3	Micrometer	(50-75 mm)	2
4	Vernier Caliper	(0-150 mm)	5
5	Vernier Height Gauge	(0-300 mm)	2
6	Vernier Depth Gauge	(0-300 mm)	2
7	Slip Gauge set	83 pieces	1
8	Gear tooth Vernier	1 to 26 DP	1
9	Sine Bar	Size 200mm	1
10	Sine Centre	Size 200mm	1
11	Bevel Protractor	Range:360 Deg, LC: 5 min	1
12	Floating Carriage Micrometer	(0-25 mm)	1
13	Profile Projector	Max distance of Vice movement 25mm each direction	1
14	Tool Makers Microscope	Eye Piece 30X standard Magnification	1
15	Mechanical Comparator	Vertical Range 130mm and 130mm	1
16	Electrical Comparator	200m of LC 0.1m	2
17	Pnuematic Comparator	Range: 0.001 to 0.04 mm	1
18	Autocollimator	Measuring range 25 minutes	1
19	Temperature Measuring Setup	Temperature Range: 0-100 degree centigrade	1

20	Displacement Measuring Setup	LVDT Range: ±10 mm	1
21	Force Measuring Setup	Load cell: 1 Kg Capacity Resolution: 0.01Kg	2
22	Torque Measuring Setup	Torque Cell: 1 kg-m capacity Loading: L angle and 1 m length fulcrum arm	2
23	Vibration measuring/Shock measuring setup	Vibration Generation: Capacity 5 N Excition Frequency: 50Hz to 1KHz	1
24	Cylindrical Bore gauge	(18-35mm)	1
25	Telescope Gauge	8-150mm)	1
26	Surface finish measuring equipment	Max.tracing length 17.5mm Min.tracing length 1.3mm	1

DYNAMICS LABORATORY

Major Equipments Available in the Lab

Sl.No	Name of the Equipments	Specification	Quantity
1	Cam follower setup.	-	1
2	Motorised gyroscope	-	1
3	Governor apparatus - Watt, Porter, Proell and Hartnell governors	-	1
4	Whirling of shaft apparatus.	-	1
5	Dynamic balancing machine.	-	1
6	Two rotor vibration setup.	-	1
7	Spring mass vibration system.	-	1

8	Torsional Vibration of single rotor system setup.	-	1
9	Gear Models	-	1
10	Kinematic Models to study various mechanisms	-	1
11	Turn table apparatus	-	1
12	Transverse vibration setup of cantilever		1

COURSES OFFERED

Sl.No	Odd Sem (Course code & Name)	Class	Even Sem (Course code & Name)	Class
1	ME3581 Metrology and Dynamics Laboratory	III MECH	-	-

ME3581 METROLOGY & MEASUREMENTS LABORATORY

OBJECTIVES:

1 To study the different measurement equipment and use of this industry for quality inspection.

2 To supplements the principles learnt in dynamics of machinery.

3 To understand how certain measuring devices are used for dynamic testing.

OUTCOMES:

At the end of the course the students would be able to

CO1. The students able to measure the gear tooth dimensions, angle using sine bar, straightness.

CO2. Determine mass moment of inertia of mechanical element, governor effort and range of sensitivity.

CO3. Determine the natural frequency and damping coefficient, critical speeds of shafts

METROLOGY LABORATORY

LIST OF EXPERIMENTS

1. Calibration and use of linear measuring instruments – Vernier caliper, micrometer, Vernier height gauge, depth micrometer, bore gauge, telescopic gauge, Comparators.

2. Measurement of angles using bevel protractor, sine bar, autocollimator, precision level.

3. Measurement of assembly and transmission elements - screw thread parameters – Screw thread Micrometers, Three wire method, Toolmaker's microscope.

4. Measurement of gear parameters – Micrometers, Vernier caliper, Gear tester.

5. Measurement of features in a prismatic component using Coordinate Measuring Machine (CMM), Programming of CNC Coordinate Measuring Machines for repeated measurements of identical components.

6. Non-contact (Optical) measurement using Measuring microscope / Profile projector and Video measurement system.

7. Surface metrology - Measurement of form parameters – Straightness, Flatness, Roundness,Cylindricity, Perpendicularity, Runout, Concentricity – in the given component using Roundness tester.

8. Measurement of Surface finish in components manufactured using various processes (turning, milling, grinding, etc.,) using stylus based instruments.

DYNAMICS LABORATORY

LIST OF EXPERIMENTS

1. Study of gear parameters.
2. Epicycle gear Train.
3. Determination of moment of inertia of flywheel and axle system.
4. Determination of mass moment of inertia of a body about its axis of symmetry.
5. Undamped free vibrations of a single degree freedom spring-mass system.
6. Torsional Vibration (Undamped) of single rotor shaft system.
7. Dynamic analysis of cam mechanism.
8. Experiment on Watts Governor.
9. Experiment on Porter Governor.
10. Experiment on Proell Governor.
11. Experiment on motorized gyroscope.
12. Determination of critical speed of shafts.