

IV B.Tech I Semester

15AME62-METROLOGY, INSTRUMENTATION AND DYNAMICS LABORATORY

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Course objectives:-

- To educate students on different measurement systems and on common types of errors.
- To introduce different types of sensors, transducers and strain gauges used for measurement.
- To give knowledge about thermocouples, thermometers and flow meters used for measurements To introduce measuring equipments used for linear and angular measurements.
- To familiarize students with different types of governors, static dynamic, dynamic and cam analyser equipments.

Any 4 experiments from each section**Section A:**

1. Measurement of bores by internal micrometers and dial bore indicators.
2. Use of gear teeth vernier calipers and checking the chordal addendum and chordal height of spur gear.
3. Alignment test on the lathe and milling machine
4. Study of Tool makers microscope and its application
5. Angle and taper measurements by Bevel protractor, Sine bars, spirit level etc.
6. Thread measurement by Two wire/ Three wire method.
7. Surface roughness measurement by Talysurf instrument.
8. Use of straight edge and spirit level in finding the flatness of surface plate.

Section B:

1. Calibration of Pressure Gauges
2. Calibration of transducer or thermocouple for temperature measurement.
3. Study and calibration of LVDT transducer for displacement measurement.
4. Study and calibration of capacitive transducer for angular measurement.
5. Study and calibration of photo and magnetic speed pickups for the measurement of speed.
6. Study and calibration of a rotometer for flow measurement.
7. Study and use of a Seismic pickup for the measurement of vibration amplitude of an engine bed at various loads.
8. Study and calibration of McLeod gauge for low pressure.

Section C:

1. Experiment on static and dynamic balancing.
2. Experiment on universal governor
3. Experiment on CAM analysis machine.
4. Study of Inversion of Four Bar Mechanism.

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Course outcomes:-

At the end of course the students will have:

- Apply the procedures to measure length, width, depth, bore diameters, internal and external tapers, tool angles, and surface roughness by using different instruments.
- Measure effective diameter of Thread profile using different methods 3. Conduct different machine alignment tests.
- Apply the procedures to measure Temperature, Displacement, flow measurement and pressure measurement.
- Hands on training on universal governor, CAM analysis, static and Dynamic balancing equipments.

