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 surface roughness measurements on machine components.

Course Outcome:
- Students will be able to work in Quality control and quality assurances divisions in industries.
- Students will be able to design a sensors and transducers used for stress analysis.
- Students will be able to design a measuring equipments for the measurement of temperature and flow.
- Students will be able to maintain quality in engineering products.

Unit I

Unit II

Unit III
thermometers – thermistors – constructional details – measuring circuits for thermistors – thermo
electric thermometers – laws of thermocouples – industrial thermocouples and their ranges –
making of thermocouple junctions – ambient temperature compensation – pyrometers – optical
total radiation and photo electric – measurement of flow – need for flow metering – rotameter –
theory and constructional details – magnetic flow meters – hotwire anemometers.

Unit IV
Linear and Angular measurements: Slip gauges - stack of slip gauge – method of selecting
slip gauges – adjustable slip gauge – measurement of angles – sine bar checking unknown angles
– sine center – sources of error – angle gauges - optical instruments for angular measurement –
auto collimator – applications – straightness and square ness – angle dekkor – precision spirit
levels – clinometers.

Unit V
Miscellaneous measurements: Measurement of surface roughness – surface texture – primary
texture – secondary texture and the lay specification for surface textures – methods for
measuring surface finish – the Talysurf instrument – the profilograph – Tomlinson surface meter
– Tracer type profilograph – measurement of screw thread profiles – errors in pitch –
microscopic method – measurement of internal thread – measurement of effective diameter –
two wire and three wire method – measurement of root diameter – gear tooth measurement-
measurement of gear profile – tooth thickness – tooth spacing – pitch circle diameter –
Parkinson’s gear tester – the coordinate measuring machine constriction and operation .

Text Books:

Reference Books