

## Precision Measuring Instruments

This three-day course begins with a look at fundamentals of measurement and errors followed by a review of the principles of metrology. Standard tools used for measuring and inspection are covered, including scales, calipers and dividers, Vernier calipers and dial calipers, micrometers, gauge blocks, mechanical indicators, and dial indicators, as well as a review of torque measurement. The last portion of the course covers fixed gauges.

### I. Gauging Overview

- History of Gauging
- Gauging Fundamentals
- Measurement Errors
- Cleanliness
- Care and Handling of Instruments
- Metrology

### II. Standard Tools for Measuring and Inspection

- Scales
- Calipers and Dividers
- Vernier Calipers and Dial Calipers
- Gauge Blocks
- Mechanical Indicators
- Torque Measurement

### III. Fixed Gauges

- Types of Fixed Gauges
- Limit Gauges for Length Dimensions
- Cylindrical Limit Gauges
- Fixed Gauges for Multiple Dimensions