PT ATMI BizDEC

TRAINING PROGRAM SYLLABUS

Applied Industrial Metrology Program for Quality Assurance
(Program Metrologi Industri Terapan untuk Penjaminan Kualitas)

1. General Information

Program Name : Applied Industrial Metrology Program for Quality Assurance
Program Code : PM019.01
Duration : 40 Learning Hours (JP)
Learning Method : Blended (Theory + Machine Practice + Project-Based Learning)
Target Participants

- Manufacturing operators/technicians
- Quality Control/Quality Assurance personnel
- Vocational engineering students
- Personnel involved in industrial measurement and testing

Participant Requirements

- Basic understanding of technical drawings
- Basic understanding of manufacturing processes

2. Program Description

This program is designed to equip participants with knowledge and skills in precision measurement, material testing, and the application of digital technology in industrial measurement systems.

The program covers an understanding of metrology and measuring instrument characteristics; dimensional and geometric measurement based on GD&T; inspection and calibration; measurement error analysis; application of standards and QC/QA; material testing; and the use of digital metrology for data collection, SPC, IoT integration, CMM, and Smart Factory implementation.

Learning integrates theory with demonstrations, hands-on practice, case studies, and coaching to develop measurement accuracy, analytical capability, consistency of results, and the ability to use measurement data for quality control and process improvement.

3. Learning Objectives

After completing this program, participants are expected to be able to:

- Understand the concepts, scope, and principles of industrial metrology.
- Understand the characteristics of measuring instruments and select instruments according to measurement requirements.
- Read and apply technical drawings, tolerances, GD&T, and surface finish requirements in measurement.
- Perform dimensional and geometric measurements accurately.
- Understand inspection, calibration, and traceability of measuring instruments.
- Identify and calculate measurement errors.
- Understand the application of standards, QC, and QA in measurement processes.
- Understand material types and the principles of material testing.
- Understand the concept and application of digital metrology in manufacturing.
- Understand the integration of measurement data with SPC, IoT, CMM, and Smart Factory systems.

4. Impact-Oriented Outcomes

Participants will be able to:

- Perform precision measurements according to the characteristics and tolerances of workpieces.
- Analyze geometric characteristics and deviations in measurement results.
- Conduct inspections and understand the calibration process for measuring instruments.
- Identify sources of error and determine corrective actions.
- Interpret measurement results to support QC/QA.
- Understand material testing processes and results.
- Understand the digital measurement data flow from instruments to quality control systems.
- Understand the use of measurement data for SPC, real-time monitoring, and predictive quality.

5. Training Material Structure

No.	Module	Sub-Material	Duration	Method
1	Precision Metrology & Quality Measurement	General metrology & scope; measuring instrument characteristics and selection; dimensions, tolerances, surface finish & GD&T; geometric measurement (flatness, parallelism, perpendicularity, angularity, symmetry, runout, etc.); dial indicator measurement; MMC; error calculation; calibration & traceability; international standards; QC & QA; measurement practice.	16 JP	Theory + Demonstration + Practice + Case Study
2	Material Testing	Types and characteristics of materials; principles and methods of material testing; use of material testers; testing procedures; reading and interpretation of test results.	12 JP	Theory + Demonstration + Practice
3	Digital Metrology & Smart Factory	Digital metrology concepts; digital measuring tools & data acquisition; wireless measurement & IoT; instrument and system integration; CMM & automated measurement; SPC, Cp/Cpk & control limits; real-time monitoring; quality dashboards; MES/ERP; predictive quality; implementation of digital metrology toward Smart Factory.	12 JP	Theory + Demonstration + Case Study + Practice

6. Learning Methodology

- Instructor-led training – structured delivery of concepts.
- Demonstration – demonstration of equipment use and measurement/testing procedures.
- Hands-on practice – direct practice using measuring instruments.
- Measurement & testing exercise – measurement and testing exercises.
- Case study – analysis of errors, quality issues, and industrial applications.
- Coaching – guidance during practical activities.
- Discussion & review – discussion of results and learning evaluation.

7. Learning Media & Facilities

- Mechanical and precision measuring instruments
- Digital measuring instruments
- Material testing equipment/methods
- Calibration aids and measurement standards
- Surface plate and supporting measurement equipment
- Workpieces and test specimens
- Measurement data processing devices/software
- Technical drawings and training modules

8. Evaluation & Assessment

- Tests on understanding of metrology concepts and terminology.
- Exercises in interpreting drawings, tolerances, and GD&T.
- Assessment of measurement and testing practices.
- Assessment of measuring instrument inspection and calibration.
- Analysis of measurement/testing errors and results.
- QC/QA and digital metrology case studies.
- Assessment of understanding of digital technology applications in industrial measurement.

9. Training Output / Key Deliverables

Participants will produce:

- Measurement result sheets and analyses.
- Results of measuring instrument inspection/calibration practice.
- Material testing results.
- Measurement/testing error analysis.
- Interpretation of measurement data and results.
- A case study on the application of digital metrology in quality control.

10. Certification

- Training Certificate (Completion Certificate)
- Competency Certificate (optional, through a competency assessment according to participant needs)

11. Instructor

Instructors are practitioners and/or experienced trainers in industrial metrology, precision measurement, material testing, quality control, and manufacturing

Syllabus Approval Page
Applied Industrial Metrology Program for Quality Assurance

Program Code : PM-019.01

Prepared by,
Indira Kusumawardani
Research and Development
Date : [04/09/2026]

Reviewed by,
Vinsentius Bram Armunanto, S.T., M.T.
Trainer / Expert
Tanggal : [04/09/2026]

Approved by.
Margareta Ratnawati, S.T., M.M.
Operational Manager
Tanggal : [04/09/2026]