MAWA EVENTS

Address: No. 857, Block A2. Leisure Commerce Square - No 9., 46150 Petaling Jaya, Selangor, Malaysia

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MEASUREMENT SYSTEM ANALYSIS (MSA) GAUGE REPEATIABILITY & REPRODUCIBILITY (GR&R)

""Ensuring Data Accuracy and Process Control Through Measurement System Validation""

Schedule

Date	Venue	Fees (Face-to-Face)
29 – 30 Jan 2026	Kuala Lumpur, Malaysia	USD 1995 per delegate

Introduction

In any manufacturing or process environment, decisions are only as good as the data that supports them. Measurement System Analysis (MSA) ensures that the data collected from inspection and testing equipment is accurate, reliable, and repeatable. GR&R (Gauge Repeatability and Reproducibility) studies are the cornerstone of MSA, providing insight into the quality of the measurement process.

This intensive two-day course equips quality professionals, engineers, and lab personnel with the skills to plan, conduct, and interpret GR&R studies. Participants will learn how to evaluate measurement variation, assess gauge suitability, and make data-driven improvements to inspection systems.

Objectives

By the end of this course, participants will be able to:

- Understand the principles and importance of MSA in quality systems.
- Conduct Gauge Repeatability & Reproducibility (GR&R) studies.
- Distinguish between repeatability, reproducibility, and other sources of variation.
- Evaluate the adequacy of a measurement system for process control.
- Apply statistical tools to interpret MSA results and improve gauge performance.
- Align MSA activities with IATF 16949 and ISO 9001 quality system requirements.

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Why Attend

- Improve data integrity in your manufacturing or inspection process.
- Ensure that measurement systems are reliable before using data for quality decisions.
- Avoid costly product or process errors driven by inaccurate measurements.
- Strengthen quality system compliance with industry standards.
- Gain hands-on experience with MSA tools, templates, and case studies.

Target Audience

This program is designed for:

- Quality engineers and inspectors
- Manufacturing and process engineers
- Lab technicians and metrology staff
- Six Sigma practitioners and SPC analysts
- Quality managers responsible for system validation and audits

Individual Benefits

Key competencies that will be developed include:

- Measurement system evaluation
- GR&R study planning and analysis
- Statistical thinking and data interpretation
- MSA reporting and decision-making
- Quality system compliance and documentation

Organizational Benefits

Upon completing the training course, participants will demonstrate:

- Improved reliability of inspection and test data
- Reduced measurement variation and uncertainty
- Stronger control over product quality and compliance
- Enhanced readiness for audits and customer assessments
- More confident process improvement decisions

Instructional Methodology

The course follows a blended learning approach combining theory with practice:

- Concept Briefings – Core statistical concepts and MSA framework
- Case Studies – GR&R challenges and corrective actions
- Excel-Based Tools – GR&R templates, attribute agreement forms, and statistical calculators
- Workshops – Conducting and interpreting MSA experiments
- Peer Discussion – Review of real examples and action planning
- Templates – MSA planning sheets, control plans, and acceptance criteria

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Course Outline

Detailed 2-Day Course Outline

Training Hours: 7:30 AM – 3:30 PM Daily Format: 3–4 Learning Modules | Coffee breaks: 09:30 & 11:15 | Lunch Buffet: 01:00 – 02:00

Day 1: MSA Fundamentals & GR&R Planning

- **Module 1: Introduction to MSA and Data Integrity (07:30 – 09:30)**
- Why measurement system validation matters
- Overview of MSA and the types of studies
- Definitions: accuracy, precision, bias, linearity, stability
- **Module 2: Planning a GR&R Study (09:45 – 11:15)**
- Measurement variation sources
- Designing studies: number of parts, operators, trials
- Choosing the right MSA method (variable vs. attribute)
- **Module 3: Repeatability and Reproducibility Analysis (11:30 – 01:00)**
- Understanding repeatability (equipment variation)
- Understanding reproducibility (operator variation)
- Measurement discrimination and resolution
- **Module 4: Hands-On Workshop – Designing a GR&R Study (02:00 – 03:30)**
- Simulate planning a real-world study and collect mock data

Day 2: Statistical Analysis, Interpretation & Improvement

- **Module 5: GR&R Study Execution and Data Collection (07:30 – 09:30)**
- Conducting studies: data entry and observation tips
- Common errors and best practices
- Real-time calibration check integration
- **Module 6: Statistical Analysis Using Excel (09:45 – 11:15)**
- Using ANOVA and range-based methods
- Key outputs: %GRR, %Contribution, Number of Distinct Categories (NDC)
- Acceptance criteria and interpretation rules
- **Module 7: Attribute Agreement and Audit Readiness (11:30 – 01:00)**
- Non-variable data and subjective inspection
- Attribute agreement analysis (AAA) overview
- Documenting results and responding to audits
- **Module 8: Final Case Simulation & Action Planning (02:00 – 03:30)**
- Teams complete a GR&R scenario and prepare a summary report
- Peer review and instructor feedback

Certification

Participants who complete the program will receive a **Certificate of Completion in Measurement System Analysis (MSA) – GR&R** , validating their ability to plan, execute, and interpret GR&R studies in line with quality system requirements.

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Why Choose MAWA Events

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In-House / Customized Training Interested in running this course for your team? Please contact us:	TEL: **+601116373203**	EMAIL: **info@mawaevents.net**