

# GR&R STUDIES (MEASUREMENT SYSTEM)



## Introduction

GR&R Studies is a method for evaluating and quantifying an existing gauge or inspection system. It determines if an inspection method or equipment produce acceptable, marginal or unacceptable results. It is often taken for granted that inspection results are true values with no errors. In reality, all inspection or gauge results are subject to variation. It is a required component for calculating process validation, and the acceptability level for a production process.

Application of Gage Repeatability and Reproducibility (GR&R) Studies can give rise to the following benefits:-

- A criterion to accept new measuring equipment.
- A comparison of one measuring equipment against another.
- A basis for evaluating a gauge suspected of being deficient.
- A comparison for measuring equipment before and after repair
- Assess the impact of GR&R on Process Capability Studies.

## Duration

2 days | 9am – 5pm | 14 hours

## Who should attend

This course is particularly suitable for and benefit to Engineers, Supervisors, Process Specialists or any personnel involved in quality assurance, process control and continual improvement activities.

## Course Fees

Member: S\$563.76  
Non-Member: S\$602.64  
*Registration Fee of S\$17.28 apply*  
*SDF funding & SkillsFuture applicable*  
*All fees stated are inclusive of 8% GST*

## Award of Certificate

Certificate of Completion will be issued to participants who have attended at least 75% of the course.



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## Course Contents

**Day 1: 9:00AM – 05:00PM**

### **Main Concept of Measurement System**

- Measurement System
- Measurement / Tolerance
- Process In-Control
- Measurement System Analysis
- Gauge Capability Studies

### **Computation Techniques Associated with GR&R**

- Standard Deviation / Rbar / d2 / Ro / d2

### **Types of Measurement System Variation**

- Bias / Repeatability / Reproducibility / Stability / Linearity

### **Repeatability & Reproducibility (R&R) / Gage Capability**

- Computation of Combined GR&R using individual R & R Values
- Computation of Combined GR&R using Quick Approximation Method

### **Procedure for Determining GR&R & % GR&R**

**Day 2: 09:00AM – 05:00PM**

### **Computation of %GR&R & Its Interpretation During Application**

- Calculation of GR&R
- Process Variation
- Percent of Tolerance

### **Use of GR&R Data Sheet & GR&R Report Format**

- GR&R Data Sheet
- GR&R Report Format

### **Practical Method for Reducing Unacceptable GR&R Result**

- Six Sigma Spread
- Determination of GR&R Reduction Percentage

### **Impact of GR&R on Process Capability Studies**

- Process Capability Studies coupled with GR&R
- Process Capability Studies with reduced GR&R

### **Application of Calibration Techniques In Measurement System**

- Physical Calibration
- Comparative Techniques
- Inter-laboratory Comparisons

### **Class-room Assignment & Exercises**



Please refer to this URL  
<https://www.sqi.org.sg/courses/>  
or QR Code for soft copy  
and updated training schedule

### **Membership Application**

Register membership online at  
**[www.sqi.org.sg/membership-join/](http://www.sqi.org.sg/membership-join/)**  
or contact us to get the membership  
application form.

Membership Categories:

- ~ Organisation membership
- ~ Individual membership

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