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Course Name

Advanced Mechanical Measurement

Sector Name

Mechanical Engineering

Document Type

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Advanced Mechanical Measurement

Course Introduction

This training course is designed to provide participants with the proficiency in utilizing components of mechanical measurement systems to perform precise measurements. The diploma course on Mechanical Measurement Systems instructs participants on the components and operations involved in accurate measurements.

This course will provide them with instrumentation skills and specialized knowledge to correctly take specific measurements. Additionally, participants will gain insights into uncertainty analysis and the application of statistical tools for analyzing measurement inputs.

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Target Audience

- ✓ Mechanical Engineers – Focused on accuracy in system analysis and diagnostics.
- ✓ Maintenance & Reliability Engineers – Ensuring machine efficiency and predictive maintenance.
- ✓ Quality Control & Inspection Managers – Overseeing compliance with mechanical standards.
- ✓ R&D and Test Engineers – Conducting performance testing and innovation.
- ✓ Asset & Condition Monitoring Specialists – Using advanced measurement tools for failure prevention.

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Learning Objectives

- ✓ Identify the different measurement concepts and elements of instruments
- ✓ Understand interference in measurements and methods of correcting it
- ✓ Determine the loading effect from impedance matching
- ✓ Learn the static characteristics of measuring instruments
- ✓ Explain the relevance of compensating input and output values of measurements to reducing errors
- ✓ Compare the zero-order system to the first-order system and the higher-order systems to the second-order systems
- ✓ Describe temperature and strain measurements
- ✓ Recall force, displacement, and sound measurements
- ✓ Analyze thermo-physical and air pollution sampling measurements

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Advanced Mechanical Measurement

Course Outline

✓ 01 DAY ONE

Introduction to Measurement

- ✓ Measurement Concepts
- ✓ Elements of Instruments
- ✓ Classification of Measuring Instruments
- ✓ Correcting Interference and Modifying Inputs

Static Characteristics of Measuring Instruments

- ✓ Static Characteristics of Measuring Instruments I
- ✓ Static Characteristics of Measuring Instruments II
- ✓ Loading Effect and Impedance Matching

Introduction to Statistical Analysis

- ✓ Chi-Square Test
- ✓ Least Squares Method
- ✓ Uncertainty Analysis
- ✓ Problem Solving I
- ✓ Measuring System Models

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Course Outline

✓ 02 DAY TWO

Zero and First Order System

- ✓ First Order System - Step Response
- ✓ First Order System - Ramp Response
- ✓ First Order System - Impulse Response
- ✓ First Order System - Frequency Response

Second and Higher Order System

- ✓ Second Order System - Step Response
- ✓ Second Order System - Ramp Response
- ✓ Second Order System - Impulse and Frequency Response
- ✓ Higher Order Systems

Compensation, Transducers, and Flow Measurement

- ✓ Introduction to Transducers
- ✓ Selection and Classification of Transducers
- ✓ Introduction to Flow Measurement
- ✓ Flow Meters

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Course Outline

✓ 03 DAY THREE

Measuring Temperature and Strain

- ✓ Introduction to Measuring Temperature
- ✓ Using Thermometers and Temperature Sensors
- ✓ Strain Gauges
- ✓ Piezoelectric Transducers

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Course Outline

✓ Day 04

Measuring Force, Displacement, and Sound

- ✓ Measuring Pressure
- ✓ Measuring Force and Torque
- ✓ Measuring Displacement and Acceleration
- ✓ Measuring Sound

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Course Outline

✓ Day 05

Thermo-physical and Air Pollution Sampling Measurements

- ✓ Measuring Thermo-Physical Properties
- ✓ Flow Visualization
- ✓ Measuring Air Pollution Sampling
- ✓ Problem Solving II
- ✓ Thermo-physical and Air Pollution Sampling Measurements

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Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
May 23, 2027	May 27, 2027	5 days	4250.00 $	KSA , Riyadh
July 26, 2027	July 30, 2027	5 days	4250.00 $	UAE , Dubai
Oct. 5, 2026	Oct. 9, 2026	5 days	4950.00 $	England , London
Jan. 11, 2027	Jan. 15, 2027	5 days	4250.00 $	UAE , Abu Dhabi

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