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Course Name

Industrial Instrumentation & Measurement Systems

Sector Name

Instrumentation & Controls

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Industrial Instrumentation & Measurement Systems

Course Introduction

Industrial operations depend on accurate measurement of process conditions such as pressure, temperature, flow, and level. Yet selecting or using an instrument effectively requires more than understanding what variable it measures. Process characteristics, measurement range, response, accuracy, installation, environmental conditions, signal transmission, and control-system requirements all influence whether measurement information truly represents what is happening in the process.

Boost Consulting & Training offers this course to develop a practical engineering understanding of industrial instrumentation and measurement systems. Participants explore measurement principles, sensing technologies, instrument selection, field installation, signal transmission, measurement performance, and the application of pressure, temperature, flow, and level instruments. Practical exercises focus on matching measurement technologies with real process conditions and recognizing factors that can compromise measurement quality.

The **main concept of this course** is to treat industrial measurement as a complete engineering chain from the process conditions being measured to the reliable information delivered to monitoring and control systems.

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Industrial Instrumentation & Measurement Systems

Target Audience

- ✓ Instrumentation and control engineers
- ✓ Process and automation engineers
- ✓ Instrument technicians and technical specialists
- ✓ Engineers responsible for industrial measurement and process monitoring

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Industrial Instrumentation & Measurement Systems

Learning Objectives

- ✓ Explain the structure and functions of industrial instrumentation and measurement systems.
- ✓ Interpret key measurement characteristics including range, accuracy, repeatability, resolution, and response.
- ✓ Select appropriate measurement technologies for different process applications.
- ✓ Evaluate pressure and differential pressure measurement arrangements.
- ✓ Compare temperature measurement technologies and their application requirements.
- ✓ Select suitable flow and level measurement methods according to process conditions.
- ✓ Assess field installation and signal transmission factors affecting measurement quality.
- ✓ Identify measurement problems and improve the reliability of instrument information.

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Industrial Instrumentation & Measurement Systems

Course Outline

✓ DAY 01

Building the Measurement Chain

Understanding Industrial Measurement

- ✓ Trace the measurement path from process variable through sensing, conversion, transmission, and indication.
- ✓ Distinguish sensors, transducers, transmitters, indicators, switches, and related instrument functions.
- ✓ Connect measurement information with monitoring, control, protection, and operational decisions.

Reading Instrument Performance

- ✓ Interpret range, span, accuracy, precision, repeatability, resolution, sensitivity, and response.
- ✓ Recognize common sources of measurement error and uncertainty in industrial applications.
- ✓ Complete an Instrument Performance Challenge using different measurement specifications.

Industrial Instrumentation & Measurement Systems

Course Outline

✓ DAY 02

Measuring Pressure and Temperature

Engineering Pressure Measurement

- ✓ Compare gauge, absolute, differential, and vacuum pressure measurement.
- ✓ Evaluate common pressure-sensing and transmitter technologies.
- ✓ Apply differential pressure measurement to practical industrial applications.

Engineering Temperature Measurement

- ✓ Compare thermocouples, RTDs, and other industrial temperature measurement technologies.
- ✓ Evaluate measurement range, response, accuracy, environment, and installation requirements.
- ✓ Complete a Pressure & Temperature Instrument Selection Exercise for contrasting process conditions.

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Course Outline

✓ DAY 03

Measuring Industrial Flow

Understanding Flow Measurement Technologies

- ✓ Compare differential pressure, magnetic, vortex, ultrasonic, Coriolis, and other common flow technologies.
- ✓ Connect fluid properties and operating conditions with measurement performance.
- ✓ Identify limitations that make particular technologies unsuitable for certain applications.

Selecting the Right Flow Instrument

- ✓ Evaluate flow range, pressure, temperature, conductivity, density, installation, and accuracy requirements.
- ✓ Consider straight-run requirements and piping conditions that influence measurement quality.
- ✓ Complete a Flowmeter Selection Challenge across different liquid, gas, and steam applications.

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Course Outline

✓ DAY 04

Measuring Level under Different Process Conditions

Understanding Level Measurement

- ✓ Compare direct, differential pressure, radar, ultrasonic, capacitance, and other level technologies.
- ✓ Distinguish continuous measurement from point-level detection.
- ✓ Evaluate the effects of density, pressure, temperature, vapor, foam, and vessel geometry.

Solving Difficult Level Applications

- ✓ Select measurement approaches for closed vessels, interface measurement, and challenging process conditions.
- ✓ Recognize installation arrangements that can create misleading level readings.
- ✓ Conduct a Level Measurement Application Case requiring technology selection and installation decisions.

Industrial Instrumentation & Measurement Systems

Course Outline

✓ DAY 05

Delivering Reliable Measurement to the Control System

Managing Instrument Signals and Installation

- ✓ Understand common analog, digital, and field instrument signal arrangements.
- ✓ Examine grounding, shielding, impulse lines, mounting, environmental exposure, and installation effects.
- ✓ Identify where measurement quality can deteriorate between the process and the control system.

Evaluating the Complete Measurement System

- ✓ Trace abnormal readings through the sensor, transmitter, installation, signal path, and process conditions.
- ✓ Distinguish genuine process changes from measurement-system problems.
- ✓ Complete an Industrial Measurement System Case from application requirements through instrument selection, installation, signal evaluation, and final measurement verification.

Industrial Instrumentation & Measurement Systems

Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
Dec. 21, 2026	Dec. 25, 2026	5 days	4950.00 \$	England , London
Jan. 4, 2027	Jan. 8, 2027	5 days	4250.00 \$	UAE , Dubai
April 25, 2027	April 29, 2027	5 days	4250.00 \$	KSA , Riyadh
July 5, 2027	July 9, 2027	5 days	4250.00 \$	UAE , Abu Dhabi

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