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Course Name

Industrial Instrumentation & Modern Process Control Systems

Sector Name

Instrumentation & Controls

Document Type

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Industrial Instrumentation & Modern Process Control Systems

Course Introduction

Instrumentation can be viewed as the eyes and the ears of the operator in the modern plant. They are there to collect information and to assist the operator in analyzing current plant conditions. The operator is then better equipped to make the necessary decisions pertaining to better control of the plant. Of course, not all of the control decisions fall to the domain of the plant operator. Many processes are automated. In the past, excellent analogue equipment was available to perform the control function. In the current digital world, modern control systems have come to the fore. These include model-based control equipment.

This **BOOST** Industrial Instrumentation and Modern Control Systems training course combines all of this into one powerful, high-impact week of learning. The workshop starts off discussing aspects of transmitters, along with the modern choice of fieldbus and HART, and other communication aspects. It then delves into final control elements (many of them adjustable). This is followed by important aspects of pressure, level, temperature, and flow. The workshop then moves into process control and loop tuning, ending with model-based control systems and how this fits into the modern notion of process control.

Participants attending the Industrial Instrumentation and Modern Control Systems training course will develop the following competencies:

- ✓ Be able to work with and convert modern instrumentation signals
- ✓ The cognitive ability to implement a modern network-based system
- ✓ Comprehensive understanding of PID control
- ✓ Effective tuning of most modern control loops
- ✓ Implement a model-based control system
- ✓ Effectively deal with large dead times

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Target Audience

- ✓ Control & Instrumentation Engineer
- ✓ Controls Technologist
- ✓ Instrumentation Technician / Systems Control Tech
- ✓ Senior Control & Instrumentation Engineer
- ✓ Maintaining Equipment Engineer
- ✓ Facilities I&E / Controls Engineer
- ✓ Offshore Instrumentation Engineer

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Learning Objectives

- ✓ Define the role and objectives of instrumentation in any plant
- ✓ Understand the importance of process variables in process control
- ✓ Develop their skills in selecting the right transmitter for an application
- ✓ Improve their skills in process control strategies
- ✓ Correctly implement loop tuning strategies (using numerous methodologies)
- ✓ Understand the concept of model-based control
- ✓ Comprehend the intricacies of IMC and MPC strategies

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Course Outline

✓ 01 Day One

Introduction to Process Variable Measurement

- ✓ Sensors, Transducers, and Instrumentation Systems
- ✓ Instrumentation Signals
- ✓ Instrumentation Terms and Definitions
- ✓ HART Protocol
- ✓ Fieldbus
- ✓ Digital Communication and Techniques
- ✓ A quick introduction to final control elements (including control valves, VSD, and VFD)

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Course Outline

✓ 02 Day Two

Pressure, Level, Temperature, and Flow Measurement

- ✓ Pressure Measurement – principle of operation, devices, typical uses, and installation considerations
- ✓ Level Measurement – principle of operation, devices, typical uses, and installation considerations
- ✓ Temperature Measurement – principle of operation, devices, typical uses, and installation considerations
- ✓ Flow Measurement – principle of operation, devices, typical uses, and installation considerations

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Course Outline

✓ 03 Day Three

Process Control

- ✓ Process Dynamics
- ✓ Process Stability
- ✓ Process Responses
- ✓ Types of control that may be implemented
- ✓ The P part of PID Control
- ✓ The I part of PID Control
- ✓ The D part of PID Control
- ✓ Cascade Control

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Course Outline

✓ 04 Day Four

Advanced Control and Loop Tuning Strategies using Digital Controllers

- ✓ Ratio control
- ✓ Combined feed-forward and feedback control
- ✓ Open-loop tuning methods, using formulae
- ✓ Closed-loop tuning methods, using formulae
- ✓ Open loop tuning, using trial and error
- ✓ Closed loop tuning, using trial and error
- ✓ Dealing with processes that have large dead time

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Course Outline

✓ 05 Day Five

Model-Based Control, where a PID Controller isn't the Preferred Option

- ✓ Using a model-based controller
- ✓ Using a Smith Predictor
- ✓ Understanding Internal Model Control (IMC)
- ✓ Using Dahlin's Controller
- ✓ Understanding and implementing Model Predictive Control (MPC)

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Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
Aug. 23, 2027	Aug. 27, 2027	5 days	4250.00 $	UAE , Abu Dhabi
Oct. 25, 2026	Oct. 29, 2026	5 days	4250.00 $	Oman , Muscat
Jan. 18, 2027	Jan. 22, 2027	5 days	4250.00 $	UAE , Dubai
April 12, 2027	April 16, 2027	5 days	4950.00 $	Spain , Madrid

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