

# Industrial Process Measurement and Control Course

## Venue Information

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**Venue:** London UK

**Place:**

**Start Date:** 2025-09-29

**End Date:** 2025-10-03

## Course Details

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**Net Fee:** £4750.00

**Duration:** 1 Week

**Category ID:** EAPET

**Course Code:** EAPET-34

## Syllabus

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### Course Description

This course provides an overview of industrial measurement and control. Technicians, engineers, and managers are provided with fundamentals to more effectively communicate with other control system professionals. This course teaches a systematic approach to troubleshooting and start-up as they apply to single and multi-loop control loops. Covers how pressure, level, flow, and temperature loops operate to maintain good process control systems.

### Course Objective

Participant will be able to:

- Communicate the latest trends in measurement and control
- Understand the role of measurement and control in industrial processes
- Compare continuous, batch, and discrete control and how they are used in industry

- Understand the fundamental concepts of controller tuning
- Compare different control system architectures including single loop controllers, DCS, and PLCs
- Understand why a systematic approach to troubleshooting is most effective
- Follow specified procedures for proper loop check-out
- Verify, locate, and identify performance problems and the causes of the problems
- Take or recommend appropriate follow-up procedures to minimize problem recurrence
- Identify the common causes of sensor, transmitter, controller, and final control element problems
- Troubleshoot control systems
- Apply DCS functions for troubleshooting
- Understand pneumatic and electronic loops
- Apply safety practices for start-up
- Check and utilize control loop documentation

## **Course Outline**

### **Process Control Concepts**

- Continuous
- Batch
- Discrete Control
- The Role of Measurement and Control in Industry
- Graphic Description of Loop Components
- Component Loop Dynamics

### **Industrial Measurement Systems**

- Overview
- Sensor Selection and Characteristics
- Transmitters
- Smart Transmitters

### **Pressure Measurements**

- Concepts
- Instruments
- Differential Pressure Measurement

### **Level Measurement**

- Ultrasonic Level Measurement
- By Weight

### **Flow Measurement**

- Fluid Fundamentals
- Methods and Concepts
- Differential Head Flow Measurement
- Velocity Flow Measurement Devices
- Mass Flowmeters

### **Temperature Measurement**

- Concepts
- Thermometers
- Thermocouples
- RTDs & Thermistors
- Temperature Transmitters

### **Industrial Process Control**

- Basic Feedback Control
- Components
- PID Control
- Final Control Elements
- Tuning Concepts

### **Trends in Control Technologies**

- Smart Components
- Fieldbus

### **Approaches to Troubleshooting**

- Purpose of Troubleshooting
- Reasons for Troubleshooting Equipment History
- Input/Output (Serial) | Shotgun Approach
- Logical Analysis

### **Logical Analysis Troubleshooting**

- Measurement Concerns
- Controller Operations
- Signal Conditioners
- Troubleshooting Simulation

### **Multi-Loop Control Systems Troubleshooting**

- Ratio (Two Controlled Streams, Wild Stream)
- Cascade
- Three-Element Control
- Troubleshooting Simulation

### **Introduction to Digital Control Systems**

- Advantages
- Digital Control (DDC)
- Supervisory DC
- Supervisory Plus DDC
- Analog Back-up

### **Distributed Control Functions for Troubleshooting**

- Elements
- Displays (Graphic, Trend, Alarm)

### **Start-up Concerns**

- Safety
- Documentation
- Tuning Review