

MAINTENANCE AND ENGINEERING | ME-013

Process Control Systems: Design, Operation and Troubleshooting

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Course content

Why Attend

Process control systems keep industrial plants stable, efficient and safe. When loops are poorly designed or tuned, plants suffer from variability, energy waste, off-spec product and trips.

This Aractech course covers control system architecture, measurement and final control elements, feedback and feedforward control, PID tuning, cascade and ratio control, DCS and PLC systems, alarm management and systematic troubleshooting of control loops. Participants tune and troubleshoot loops using simulations.

Course Methodology

- Technical lectures
- Loop simulation labs
- Troubleshooting exercises
- Case studies
- Group discussions

Course Objectives

- Explain process control system architecture
- Understand measurement and final control elements
- Apply feedback, feedforward, cascade and ratio control
- Tune PID controllers for stable performance
- Use DCS and PLC systems effectively
- Troubleshoot control loop problems systematically

Target Audience

- Instrumentation and control engineers
- Process engineers

Course content

- Control room operators
- Maintenance technicians

Course outline

Detailed course outline

Day-by-day outline for Process Control Systems: Design, Operation and Troubleshooting.

Day 1 - Control System Fundamentals

- 09:00-09:39 | Purpose of process control
- 09:39-10:18 | Control system architecture
- 10:18-10:57 | Process dynamics
- 10:57-11:00 | Control loop components
- 11:00-11:30 | Coffee break
- 11:30-12:05 | Control loop components (continued)
- 12:05-12:43 | Terminology
- 12:43-14:00 | Exercise: Loop identification

Day 2 - Measurement and Final Elements

- 09:00-09:39 | Sensors and transmitters
- 09:39-10:18 | Control valves
- 10:18-10:57 | Actuators and positioners
- 10:57-11:00 | Signal types
- 11:00-11:30 | Coffee break
- 11:30-12:05 | Signal types (continued)
- 12:05-12:43 | Common faults
- 12:43-14:00 | Workshop: Valve performance review

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Day 3 - Control Strategies

- 09:00-09:39 | Feedback control
- 09:39-10:18 | PID modes
- 10:18-10:57 | Feedforward
- 10:57-11:00 | Cascade and ratio control
- 11:00-11:30 | Coffee break
- 11:30-12:05 | Cascade and ratio control (continued)
- 12:05-12:43 | Split range
- 12:43-14:00 | Lab: Strategy simulation

Day 4 - Tuning and Systems

- 09:00-09:45 | Tuning methods
- 09:45-10:30 | Performance assessment
- 10:30-11:00 | DCS and PLC systems
- 11:00-11:30 | Coffee break
- 11:30-11:45 | DCS and PLC systems (continued)
- 11:45-12:30 | Alarm management
- 12:30-14:00 | Lab: PID tuning

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Day 5 - Troubleshooting

- 09:00-09:54 | Systematic approach
- 09:54-10:48 | Oscillation and sluggishness
- 10:48-11:00 | Instrument faults
- 11:00-11:30 | Coffee break
- 11:30-12:12 | Instrument faults (continued)
- 12:12-13:06 | Documentation
- 13:06-14:00 | Capstone: Loop troubleshooting case

Seminar dates

Available seminar dates

Live dates and pricing for Process Control Systems: Design, Operation and Troubleshooting generated from the course details page.

Date	Location	Format	Fee
2 - 6 November 2026	Amsterdam	Classroom	€2,830
21 - 25 December 2026	London	Classroom	€2,315
18 - 22 January 2027	Rome	Classroom	€3,460
15 - 19 February 2027	Istanbul	Classroom	€1,978
15 - 19 March 2027	Vienna	Classroom	€3,225
19 - 23 April 2027	Barcelona	Classroom	€2,815
17 - 21 May 2027	Rome	Classroom	€3,460
21 - 25 June 2027	Geneva	Classroom	€4,315
19 - 23 July 2027	Amsterdam	Classroom	€2,830
16 - 20 August 2027	London	Classroom	€2,315

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Date	Location	Format	Fee
20 - 24 September 2027	Rome	Classroom	€3,460
18 - 22 October 2027	Istanbul	Classroom	€1,978
15 - 19 November 2027	Cape Town	Classroom	€1,625
20 - 24 December 2027	Barcelona	Classroom	€2,815
2 - 6 November 2026	Online / Live	Online / Live	€1,815
21 - 25 December 2026	Online / Live	Online / Live	€1,815
18 - 22 January 2027	Online / Live	Online / Live	€1,815
15 - 19 February 2027	Online / Live	Online / Live	€1,815
15 - 19 March 2027	Online / Live	Online / Live	€1,815
19 - 23 April 2027	Online / Live	Online / Live	€1,815

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21 - 25 June 2027	Online / Live	Online / Live	€1,815
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16 - 20 August 2027	Online / Live	Online / Live	€1,815
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