Training Course on Process Measurement, Instrumentation and Process Control

Professional Development Training Course Outline

Category	Engineering	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

In today’s fast-evolving industrial landscape, process measurement, instrumentation, and process control systems form the backbone of efficient and safe operations. Training Course on Process Measurement, Instrumentation & Process Control is tailored to provide professionals with hands-on expertise in monitoring, analyzing, and optimizing industrial processes. With increasing emphasis on Industry 4.0, predictive maintenance, and automation, understanding the intricacies of process variables, control strategies, and smart instrumentation is essential for driving operational excellence.

Through this training, participants will gain deep insights into flow measurement, pressure control, temperature regulation, and automated process management. Emphasizing real-world applications, this course integrates practical scenarios, case studies, and industry standards, enabling participants to make data-driven decisions and ensure system integrity in complex environments.

Programme Curriculum

Training Course on Process Measurement, Instrumentation & Process Control

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environments.

Course Objectives

By the end of this training, participants will be able to:

1. Understand key principles of industrial process control and instrument calibration.
2. Analyze the role of smart sensors in real-time data acquisition.
3. Evaluate and select appropriate flow, level, and pressure measuring devices.
4. Implement best practices for PID tuning and loop control.
5. Apply control system design methodologies using modern software tools.
6. Interpret process and instrumentation diagrams (P&IDs).
7. Improve system performance using feedback and feedforward control.
8. Integrate IoT-enabled instruments in process environments.
9. Troubleshoot and maintain SCADA and DCS systems.
10. Ensure compliance with ISA and IEC standards.
11. Leverage data analytics in process optimization.
12. Mitigate risks through effective safety instrumentation systems (SIS).
13. Utilize predictive maintenance and condition monitoring techniques.

Target Audience

1. Process Engineers
2. Instrumentation Technicians
3. Control System Engineers
4. Maintenance Managers
5. Automation Engineers
6. Technical Operators
7. SCADA/PLC Programmers
8. Engineering Students and Interns

Course Duration: 5 days

Course Modules

Module 1: Fundamentals of Process Measurement

- Principles of measurement systems
- Primary variables: flow, pressure, level, and temperature
- Accuracy, precision, and repeatability
- Signal conditioning and transmission
- Introduction to measurement standards (ISA, IEC)
- **Case Study**: Selection of measurement instruments in a refinery process

Module 2: Pressure and Level Measurement Techniques

- Types of pressure sensors: gauge, absolute, differential
- Level measurement: ultrasonic, radar, and float systems
- Applications in tanks and pipelines
- Calibration of pressure and level sensors
- Signal interfacing with controllers
- **Case Study**: Level measurement in a water treatment plant

Module 3: Flow and Temperature Measurement

- Types of flow meters: magnetic, ultrasonic, turbine

- Temperature measurement: thermocouples, RTDs
- Installation and configuration
- Troubleshooting flow/temperature instruments
- Performance testing
- **Case Study**: Flow measurement optimization in beverage manufacturing

Module 4: Control Systems and Loop Tuning

- Introduction to control systems (open vs closed loop)
- PID control theory and applications
- Loop tuning techniques
- Controller selection and setup
- Cascade and feedforward control
- **Case Study**: PID tuning in pharmaceutical production

Module 5: SCADA, PLC, and DCS Integration

- Architecture of SCADA, PLC, and DCS
- Programming basics and logic development
- Communication protocols (Modbus, Profibus, Ethernet/IP)
- Alarm handling and reporting
- Redundancy and system reliability
- **Case Study**: SCADA implementation in power distribution

Module 6: Smart Instrumentation and IIoT

- Role of digital communication (HART, Foundation Fieldbus)
- Wireless instrumentation systems
- Integration of IoT sensors for real-time monitoring
- Data logging and cloud storage
- Security and data integrity in smart systems
- **Case Study**: IIoT deployment in chemical processing plant

Module 7: Calibration and Maintenance Best Practices

- Types of calibration (bench, field, automatic)
- Calibration tools and documentation
- Preventive vs. predictive maintenance
- Troubleshooting strategies
- Maintenance logs and audit trails
- **Case Study**: Instrument audit in food processing facility

Module 8: Safety Systems and Process Optimization

- Safety Instrumented Systems (SIS)
- HAZOP and SIL assessments
- Emergency shutdown systems
- Process optimization through analytics
- Energy efficiency in process control
- **Case Study**: Safety and optimization in oil and gas pipeline control

Training Methodology

- Instructor-led interactive sessions
- Hands-on demonstrations and simulations
- Group discussions and problem-solving

- Real-world case study analysis
- Online quizzes and progress tracking
- Access to digital resources and downloadable materials

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
21 Sep 2026	25 Sep 2026	Online	$1,000
21 Sep 2026	25 Sep 2026	Physical	$1,500
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0

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Ready to enroll or request a customized program? Book online or contact us:

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