Accredited Africa Training Institute for Capacity Development
Unit FO409, Hatfield Plaza · 1122 Burnett St, Hatfield 0028 · Pretoria, Gauteng · South Africa
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COURSE BROCHURE

Apply Diagnostic Techniques To A Process Control System Training

Manufacturing, Engineering and Technology / Engineering and Related Design

Unit Standard 119805 · NQF Level 5 · 8 Credits · 5 Days

COURSE OVERVIEW

This course equips learners with the skills to apply diagnostic techniques to process control systems, enabling them to identify, analyse, and resolve faults efficiently. It covers systematic troubleshooting methods, interpretation of system data, and implementation of corrective actions to maintain optimal process performance.

Category	Manufacturing, Engineering and Technology
Subfield	Engineering and Related Design
Unit Standard	119805
Accreditation	SAQA Accredited · NQF Level 5 · 8 Credits
Duration	5 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS — verifiable online

LEARNING OUTCOMES

- Apply systematic diagnostic techniques to identify faults in process control systems.
- Analyse process control system data to determine root causes of malfunctions.
- Evaluate diagnostic results to select appropriate corrective actions.
- Implement corrective measures to restore process control system functionality.
- Demonstrate adherence to safety and quality standards during diagnostic procedures.
- Document diagnostic findings and actions taken for reporting and future reference.

WHO SHOULD ATTEND

- This course is designed for process control technicians, instrumentation engineers, and automation specialists who are responsible for maintaining and troubleshooting process control systems in industrial environments.

COURSE OUTLINE

Day 1: Foundations of Process Control and Diagnostic Principles

- Overview of process control systems: sensors, controllers, actuators.
- Process variables: temperature, pressure, flow, level.
- Control loop types: open-loop vs closed-loop.
- Introduction to system diagnostics: purpose and benefits.
- Common faults in process control systems.
- Safety considerations and standard operating procedures.
- Hands-on: Identifying components in a simulated control loop.

Day 2: Diagnostic Tools and Measurement Techniques

- Diagnostic equipment: multimeters, oscilloscopes, signal generators, process calibrators.
- Measurement techniques for voltage, current, resistance, and frequency.
- Signal tracing and loop checking.
- Calibration procedures for transmitters and controllers.
- Troubleshooting common sensor and actuator faults.
- Practical exercise: Diagnosing a simulated 4-20 mA loop fault.
- Reporting and documentation standards.

Day 3: Analysing Control Loop Performance

- Performance metrics: rise time, overshoot, steady-state error, oscillation.
- Trend analysis: reading charts and data logs.
- Common performance issues: sticking valves, hysteresis, deadband.
- Introduction to PID controller tuning: Ziegler-Nichols methods.
- Using software for loop analysis and tuning.
- Case study: Diagnosing a poorly performing temperature control loop.
- Practical: Tuning a simulated PID controller.

Day 4: Advanced Diagnostics and Fault Finding

- Systematic fault-finding methods: half-split, signal injection, substitution.
- Advanced tools: spectrum analysers, data loggers, HART communicators.
- Interpreting PLC diagnostic codes and alarms.
- Dealing with intermittent faults and noise issues.
- Root cause analysis techniques (5 Whys, fishbone diagram).
- Practical: Diagnosing a cascade control loop fault.
- Safety considerations during advanced diagnostics.

Day 5: Integration, Reporting, and Practical Application

- Integrating diagnostics into preventive and predictive maintenance.
- Report writing: structure, findings, corrective actions.
- Communication with stakeholders: operators, engineers, management.
- Simulated practical assessment: diagnose and resolve a multi-fault scenario.
- Review of key concepts and Q&A.;
- Final assessment and feedback.
- Course wrap-up and certification information.

ASSESSMENT & CERTIFICATION

Delegates are assessed through exercises and a final test. A mark of **50% or above** earns an **AATICD Certificate of Completion**, issued digitally with a unique verification code. This course carries **8 NQF credits** at **NQF Level 5**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 24,200.00	**R 24,200.00**
1	In-House	R 31,400.00	**R 31,400.00**
1	On-Campus (Pretoria)	R 36,200.00	**R 36,200.00**

UPCOMING SESSIONS

Start	End	Method	Venue
22 Jun 2026	26 Jun 2026	On-Campus	Mombasa, Kenya
22 Jun 2026	26 Jun 2026	On-Campus	Mbabane, Eswatini
22 Jun 2026	26 Jun 2026	On-Campus	Nairobi, Kenya
22 Jun 2026	26 Jun 2026	On-Campus	Maseru, Lesotho
22 Jun 2026	26 Jun 2026	In-House	—
22 Jun 2026	26 Jun 2026	On-Campus	Windhoek, Namibia
29 Jun 2026	03 Jul 2026	On-Campus	Maseru, Lesotho
29 Jun 2026	03 Jul 2026	On-Campus	Nairobi, Kenya

Contact us if no suitable date is listed — on-demand sessions can be arranged for groups.

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