



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

Instrumentation and Control

Custom Courses / Instrumentation & Automation

Unit Standard AATICD-0226 · NQF Level 5 · 10 Credits · 5 Days

COURSE OVERVIEW

This course equips learners with the foundational principles and practical skills required to design, implement, and maintain instrumentation and control systems used in industrial automation. Participants will gain the ability to select appropriate sensors, configure control loops, and troubleshoot common issues, ensuring efficient and safe plant operations.

Category	Custom Courses
Subfield	Instrumentation & Automation
Unit Standard	AATICD-0226
Accreditation	SAQA Accredited · NQF Level 5 · 10 Credits
Duration	5 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Demonstrate an understanding of the principles of measurement and control in industrial processes.
- Apply knowledge of sensors, transmitters, and actuators to select appropriate instrumentation for given applications.
- Analyze control loop configurations, including PID controllers, to optimize process performance.
- Design basic control strategies using programmable logic controllers (PLCs) and distributed control systems (DCS).
- Implement calibration procedures for common instruments and verify system accuracy.
- Evaluate system performance and troubleshoot faults in instrumentation and control systems.

WHO SHOULD ATTEND

- This course is ideal for technicians, engineers, and supervisors involved in process control, manufacturing, or industrial maintenance who seek to enhance their competency in instrumentation and control systems.

COURSE OUTLINE

Day 1: Fundamentals of Instrumentation and Control

- Overview of instrumentation and control systems
- Process variables and their importance
- Sensors and transducers: principles of operation
- Signal types: analog (4-20 mA) and digital
- Introduction to transmitters and signal conditioning
- Basic control concepts: open-loop vs closed-loop
- Safety and industry standards (SANS, IEC)

Day 2: Measurement and Calibration Techniques

- Calibration principles: standards, traceability, uncertainty
- Temperature measurement: RTDs, thermocouples, thermistors
- Pressure measurement: gauges, transmitters, manometers
- Flow measurement: orifice plates, Coriolis, ultrasonic
- Level measurement: differential pressure, radar, ultrasonic
- Calibration procedures and certificates
- Error analysis and troubleshooting

Day 3: Control Valves and Actuators

- Control valve components: body, trim, actuator, positioner
- Valve types: globe, ball, butterfly, diaphragm
- Actuator types: pneumatic, electric, hydraulic
- Valve characteristics: linear, equal percentage, quick opening
- Valve sizing basics (Cv calculations)
- Positioners and I/P converters
- Installation, maintenance, and troubleshooting

Day 4: Control Systems and Controllers

- Feedback control loop components
- PID controller modes: proportional, integral, derivative
- Controller tuning methods: Ziegler-Nichols, Cohen-Coon, manual
- Digital control systems: PLC, DCS, SCADA
- Communication protocols: HART, Foundation Fieldbus, Profibus
- Reading P&IDs; and loop diagrams
- Alarm management and safety instrumented systems

Day 5: System Integration, Troubleshooting, and Safety

- System integration: wiring, loop checks, commissioning
- Troubleshooting methodology: symptom to root cause
- Hazardous area classifications (ATEX, IECEx)
- Intrinsic safety and explosion-proof techniques
- Safety instrumented functions (SIF) and SIL levels
- Final assessment and practical evaluation
- Course review and Q&A;

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 **10 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
10 Aug 2026	14 Aug 2026	On-Campus	Durban, South Africa
10 Aug 2026	14 Aug 2026	On-Campus	Abu Dhabi, UAE
17 Aug 2026	21 Aug 2026	On-Campus	Harare, Zimbabwe
17 Aug 2026	21 Aug 2026	On-Campus	Shenzhen, China
24 Aug 2026	28 Aug 2026	On-Campus	Bangkok, Thailand
24 Aug 2026	28 Aug 2026	On-Campus	Victoria Falls, Zimbabwe
31 Aug 2026	04 Sep 2026	On-Campus	Lusaka, Zambia
31 Aug 2026	04 Sep 2026	On-Campus	London, UK

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

HOW TO GET A QUOTE OR APPLY

1. **Get an instant quotation online:** visit www.aaticd.co.za, open the page for this course (Unit Standard AATICD-0226) and click **Get A Quote / Apply**. Select your training method and number of delegates – your quotation is generated immediately and emailed to you with the course brochure attached.
2. **Apply by email:** send the course title, your preferred training method (Online, In-House or On-Campus Pretoria), the number of delegates and your preferred dates to apply@aaticd.co.za – our team will reply with a formal quotation.
3. **Apply by phone or WhatsApp:** call **+27 12 004 8389** or WhatsApp **+27 65 077 6310** and we will prepare your quotation and reserve your seats.
4. **Confirm your booking:** accept the quotation and settle the invoice. As soon as payment is confirmed your delegates are enrolled and receive their AATICD LMS login details by email, along with joining instructions for their chosen training method.

Group discounts apply automatically – the more delegates you enrol, the lower the price per delegate. No payment is required to request a quotation.

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