



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

Industrial Instrumentation

Custom Courses / Instrumentation & Automation

Unit Standard AATICD-0227 · NQF Level 5 · 10 Credits · 5 Days

COURSE OVERVIEW

This course provides participants with a comprehensive understanding of industrial instrumentation principles and practices. Learners will gain the skills to select, install, calibrate, and maintain instrumentation systems used in process control industries, ensuring accuracy and reliability in measurement and control applications.

Category	Custom Courses
Subfield	Instrumentation & Automation
Unit Standard	AATICD-0227
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

- Apply fundamental principles of measurement and control to industrial instrumentation systems.
- Analyze the operation and characteristics of common sensors and transmitters used in process industries.
- Evaluate calibration procedures and performance criteria for various instruments.
- Design basic instrumentation loops incorporating sensors, controllers, and final control elements.
- Implement troubleshooting strategies to diagnose and rectify instrumentation faults.
- Demonstrate safe work practices and compliance with relevant standards during instrumentation tasks.

WHO SHOULD ATTEND

- This course is designed for technicians, engineers, and technical personnel involved in the installation, maintenance, and calibration of industrial instrumentation in sectors such as manufacturing, petrochemical, mining, and utilities.

COURSE OUTLINE

Day 1: Fundamentals of Industrial Instrumentation

- Introduction to industrial instrumentation and control
- Process variables: pressure, temperature, flow, level
- Primary sensing elements and transducers
- Signal conditioning and transmission (analog vs digital)
- Instrumentation symbols and P&ID; basics
- Accuracy, precision, range, and calibration concepts
- Overview of relevant SAQA unit standards and safety regulations

Day 2: Pressure and Temperature Measurement

- Pressure measurement: types, ranges, and selection criteria
- Pressure transmitters and smart sensors
- Temperature measurement: contact vs non-contact methods
- RTD and thermocouple characteristics and wiring
- Temperature transmitters and cold junction compensation
- Calibration techniques: zero, span, and trim
- Hands-on: calibrate a pressure transmitter and RTD simulator

Day 3: Flow and Level Measurement

- Flow measurement: DP, positive displacement, turbine, electromagnetic
- Mass flow measurement (Coriolis, thermal)
- Level measurement: direct and indirect methods
- Guided wave radar and non-contact radar level transmitters
- Selection criteria: fluid properties, pipe size, accuracy
- Installation considerations: straight runs, orientation, grounding
- Hands-on: configure a magnetic flow meter and radar level transmitter

Day 4: Control Valves, Actuators, and Final Control Elements

- Control valve fundamentals: characteristics, trim, and flow coefficients
- Actuators: spring-diaphragm, piston, electric, and smart positioners
- Valve positioners: pneumatic, analog, and digital (HART, Foundation Fieldbus)
- Valve sizing and selection criteria
- Control loop components: transmitter, controller, final element
- Loop tuning basics (P, PI, PID) and effect on process
- Hands-on: calibrate a valve positioner and perform a loop check

Day 5: System Integration, Troubleshooting, and Practical Assessment

- Instrumentation system integration: wiring, marshalling, and I/O
- HART and fieldbus communication protocols
- Troubleshooting methodology: loop checks, signal tracing, fault finding
- Safety instrumented systems (SIS) and SIL basics
- Documentation: loop folders, calibration records, job cards
- Review of unit standard assessment criteria
- Hands-on: integrated practical assessment – install, calibrate, and commission a simple loop

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-0227) 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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