



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 automation

Custom Courses / Energy, Oil and Gas

Unit Standard AATICD-0277 · NQF Level 5 · 10 Credits · 5 Days

COURSE OVERVIEW

This course equips learners with the knowledge and skills to apply instrumentation and automation principles in industrial and process control environments. Participants will gain practical competence in selecting, installing, and maintaining instrumentation systems, as well as configuring automated control loops to optimize production efficiency and safety.

Category	Custom Courses
Subfield	Energy, Oil and Gas
Unit Standard	AATICD-0277
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 principles of measurement and control to select appropriate instrumentation for process variables such as pressure, temperature, flow, and level.
- Demonstrate the ability to install, calibrate, and maintain common industrial instruments according to manufacturer specifications and safety standards.
- Analyze process control loops and tune PID controllers to achieve stable and efficient system performance.
- Design basic automated control systems using programmable logic controllers (PLCs) and interpret functional control diagrams.
- Evaluate instrumentation data and implement corrective actions to ensure process reliability and quality.
- Implement safety instrumented systems (SIS) and adhere to relevant South African and international standards.

WHO SHOULD ATTEND

- This course is intended for technicians, engineers, and technical staff involved in process control, manufacturing, and industrial automation who seek to enhance their practical skills in instrumentation and automation.

COURSE OUTLINE

Day 1: Fundamentals of Instrumentation and Automation

- Introduction to instrumentation and automation
- Measurement principles and units (SI)
- Sensors and transducers overview
- Control loop components: controller, final control element
- Process variables: pressure, temperature, flow, level
- Signal types: analog, digital, pneumatic
- Calibration basics
- Safety in instrumentation

Day 2: Measurement and Sensing Technologies

- Pressure measurement: gauges, transmitters, diaphragms
- Temperature measurement: thermocouples, RTDs, thermistors
- Flow measurement: differential pressure, magnetic, ultrasonic
- Level measurement: radar, ultrasonic, capacitive
- Sensor selection criteria
- Signal conditioning: amplification, filtering
- Wiring and termination basics
- Sensor troubleshooting

Day 3: Control Systems and Controllers

- Open-loop and closed-loop control
- PID control: proportional, integral, derivative
- Controller tuning methods
- Introduction to PLCs: architecture, programming basics
- Ladder logic programming
- DCS and SCADA overview
- P&ID; symbols and interpretation
- Control valve types and characteristics

Day 4: Automation Systems and Integration

- Industrial communication protocols
- HMI design and configuration
- Data acquisition systems (DAS)
- Actuators: valves, motors, drives
- System integration approaches
- Troubleshooting automation systems
- Network topologies and wiring
- Cybersecurity basics in automation

Day 5: Advanced Applications and Practical Integration

- System design project: from concept to implementation
- Advanced control strategies: cascade, feedforward
- Calibration procedures and documentation
- Performance analysis: accuracy, repeatability, drift
- Safety instrumented systems (SIS)

- Industry 4.0 and IIoT trends
- Review and assessment

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-0277) 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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