



Accredited Africa Training Institute for Capacity Development

Unit FO409, Hatfield Plaza · 1122 Burnett St, Hatfield 0028 · Pretoria, Gauteng · South Africa

Tel: +27 12 004 8389 · Mobile: +27 65 077 6310

Email: apply@aaticd.co.za · Website: www.aaticd.co.za

COURSE BROCHURE

Instrumentation Design

Custom Courses / Instrumentation & Automation

Unit Standard AATICD-0230 · NQF Level 5 · 10 Credits · 5 Days

COURSE OVERVIEW

This course equips learners with the skills to design and specify instrumentation systems for industrial processes. It covers the selection of sensors, transmitters, controllers, and final control elements, as well as the creation of loop diagrams, instrument specifications, and installation drawings. The focus is on ensuring safe, efficient, and compliant instrumentation design in accordance with industry standards.

Category	Custom Courses
Subfield	Instrumentation & Automation
Unit Standard	AATICD-0230
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 given process parameters.
- Design instrument loops and create loop diagrams, instrument indexes, and specification sheets.
- Evaluate instrument performance and compatibility with process conditions and safety requirements.
- Implement design documentation in compliance with South African and international standards (e.g., SANS, ISA).
- Demonstrate the ability to integrate instrumentation design with control system architecture.

WHO SHOULD ATTEND

- This course is intended for instrumentation technicians, engineers, and designers involved in the specification, design, or installation of process measurement and control systems.
- It is also suitable for project managers and supervisors overseeing instrumentation projects.

COURSE OUTLINE

Day 1: Fundamentals of Instrumentation and Process Control

- Introduction to instrumentation and its industrial applications
- Overview of process variables and measurement principles
- Basic control loop components and their functions
- Instrumentation symbols, P&IDs, and documentation
- Safety considerations and standards in instrumentation

Day 2: Measurement Principles and Sensor Technologies

- Pressure measurement: gauges, transmitters, diaphragms, and strain gauges
- Temperature measurement: thermocouples, RTDs, and thermistors
- Flow measurement: differential pressure, magnetic, ultrasonic, and Coriolis
- Level measurement: radar, ultrasonic, capacitive, and displacer
- Sensor selection criteria: range, accuracy, response time, environmental factors
- Signal types: 4-20 mA, HART, Foundation Fieldbus, Profibus

Day 3: Control Valves and Final Control Elements

- Control valve components: body, trim, bonnet, packing
- Valve types: globe, ball, butterfly, gate, diaphragm
- Flow characteristics and valve sizing basics
- Actuators: spring-diaphragm, piston, electric, rotary
- Positioners and I/P converters: function and calibration
- Smart valve technology and digital positioners

Day 4: Control Systems and Loop Tuning

- Overview of control strategies: feedback, feedforward, cascade
- PID controller fundamentals and mode interactions
- Tuning methods: Ziegler-Nichols open-loop and closed-loop, Cohen-Coon
- Process response: dead time, time constant, gain
- Tuning for different process types: flow, level, pressure, temperature
- Practical considerations: noise, saturation, reset windup

Day 5: Design Project and Practical Integration

- Case study: design of a simple process control loop
- Instrument selection and specification documentation
- Loop diagram development and P&ID; review
- Simulation-based loop tuning exercise
- Troubleshooting common instrumentation issues
- Course 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-0230) 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.

Accredited Africa Training Institute for Capacity Development

Unit FO409, Hatfield Plaza, 1122 Burnett St, Hatfield 0028, Pretoria, Gauteng, South Africa
Tel: +27 12 004 8389 · WhatsApp: +27 65 077 6310 · apply@aaticd.co.za · www.aaticd.co.za