



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

Demonstrate An Understanding Of The Integrity Of Measurement And Control Philosophy Of A Process Training

Manufacturing, Engineering and Technology / Engineering and Related Design

Unit Standard 119811 · NQF Level 5 · 10 Credits · 7 Days

COURSE OVERVIEW

This course equips learners with the knowledge to understand and evaluate the integrity of measurement and control philosophies in a process environment. It covers the principles of measurement accuracy, control system reliability, and the impact of integrity on process safety and efficiency. The course ensures that participants can identify and mitigate risks associated with measurement and control failures.

Category	Manufacturing, Engineering and Technology
Subfield	Engineering and Related Design
Unit Standard	119811
Accreditation	SAQA Accredited · NQF Level 5 · 10 Credits
Duration	7 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Explain the principles of measurement integrity and control philosophy in a process environment.
- Analyze the impact of measurement errors and control system failures on process safety and product quality.
- Evaluate the integrity of measurement instruments and control loops using appropriate methods.
- Implement corrective actions to maintain the integrity of measurement and control systems.
- Demonstrate the ability to document and report integrity assessments according to standard procedures.
- Apply relevant regulations and standards to ensure compliance in measurement and control practices.

WHO SHOULD ATTEND

- This course is designed for process controllers, instrumentation technicians, and engineers who are responsible for maintaining and verifying the integrity of measurement and control systems in industrial processes.

COURSE OUTLINE

Day 1: Introduction to Measurement and Control Philosophy

- Overview of process control systems
- Measurement principles and sensor types
- Control loop elements: sensor, transmitter, controller, final control element
- Introduction to process philosophy and integrity concepts
- Regulatory framework and industry standards

Day 2: Measurement Principles and Sensor Technologies

- Pressure measurement: transducers, transmitters
- Temperature measurement: thermocouples, RTDs, thermistors
- Flow measurement: differential pressure, magnetic, ultrasonic
- Level measurement: radar, ultrasonic, displacer
- Calibration procedures and traceability
- Error analysis and uncertainty

Day 3: Control Strategies and Controller Tuning

- Feedback control: on-off, proportional, integral, derivative
- Feedforward control and ratio control
- Cascade control architecture
- PID controller tuning methods (Ziegler-Nichols, Cohen-Coon)
- Stability analysis and gain margin
- Practical tuning exercises using simulation

Day 4: Control System Components and Integration

- DCS architecture and function blocks
- PLC programming basics and ladder logic
- HMI/SCADA design principles
- Communication protocols: 4-20 mA, HART, Fieldbus, Profibus
- Troubleshooting: loop checks, signal issues
- Introduction to Safety Instrumented Systems (SIS) and SIL levels

Day 5: Measurement and Control Integrity – Quality and Reliability

- Measurement integrity: accuracy, repeatability, reproducibility
- Statistical Process Control (SPC): control charts, capability indices
- Reliability: MTBF, redundancy, fault tolerance
- Calibration management: scheduling, documentation, traceability
- Auditing measurement systems
- Case studies on integrity failures

Day 6: Advanced Control Philosophy and Optimization

- Model Predictive Control (MPC) principles
- Adaptive control and self-tuning regulators
- Process optimization: economic and performance objectives
- Data analytics for control improvement
- Integrity considerations in advanced control
- Simulation exercises on optimization

Day 7: Integration, Case Studies, and Assessment

- Comprehensive review of measurement and control philosophy
- Industry case studies: petrochemical, mining, water treatment
- Group project: design a control philosophy for a given process
- Final assessment: written and practical components
- Feedback and certification
- Action planning for continuous improvement

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 29,600.00	R 29,600.00
1	In-House	R 38,500.00	R 38,500.00
1	On-Campus (Pretoria)	R 44,400.00	R 44,400.00

UPCOMING SESSIONS

Start	End	Method	Venue
31 Jul 2026	10 Aug 2026	On-Campus	Lagos, Nigeria
03 Aug 2026	11 Aug 2026	On-Campus	Mauritius
04 Aug 2026	12 Aug 2026	On-Campus	Cape Town, South Africa
05 Aug 2026	13 Aug 2026	On-Campus	Dubai, UAE
06 Aug 2026	14 Aug 2026	On-Campus	Pretoria, South Africa
06 Aug 2026	14 Aug 2026	On-Campus	Lagos, Nigeria
07 Aug 2026	17 Aug 2026	On-Campus	Johannesburg, South Africa
10 Aug 2026	18 Aug 2026	On-Campus	Cape Town, South Africa

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 119811) 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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