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

HVAC Controls and Automation

Custom Courses / Engineering & Technical Maintenance

Unit Standard AATICD-0251 · NQF Level 5 · 10 Credits · 5 Days

COURSE OVERVIEW

This course equips learners with the knowledge and skills to design, install, and maintain HVAC control systems and automation in commercial and industrial environments. Participants will gain practical expertise in programmable logic controllers (PLCs), sensors, actuators, and building management system (BMS) integration to optimize energy efficiency and indoor comfort.

Category	Custom Courses
Subfield	Engineering & Technical Maintenance
Unit Standard	AATICD-0251
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 understanding of HVAC control principles and automation components
- Design and configure control logic for HVAC systems using PLCs and DDC controllers
- Install and calibrate sensors, actuators, and control valves for accurate system response
- Analyze and troubleshoot control system malfunctions using diagnostic tools
- Integrate HVAC controls with building management systems (BMS) for centralized monitoring
- Evaluate energy performance and apply optimization strategies through automated control sequences

WHO SHOULD ATTEND

- This course is designed for HVAC technicians, engineers, and facility managers who seek to upgrade their skills in automation and controls.
- It is also suitable for electricians and automation specialists transitioning into HVAC systems.

COURSE OUTLINE

Day 1: Fundamentals of HVAC Systems and Controls

- Overview of HVAC systems: heating, ventilation, air conditioning.
- Key components: compressors, condensers, evaporators, fans, dampers.
- Introduction to control systems: setpoints, feedback, PID control.
- Sensors: temperature, humidity, pressure, flow.
- Actuators: valves, dampers, variable frequency drives.
- Controllers: programmable logic controllers (PLC), direct digital control (DDC).
- Control strategies: on/off, proportional, integral, derivative.
- Safety and energy efficiency basics.

Day 2: Control System Architecture and Communication Protocols

- BAS architecture: field level, controller level, supervisory level.
- Communication protocols: BACnet, Modbus, LonWorks, KNX.
- Network topologies: bus, star, mesh.
- Wiring and termination practices for sensors and actuators.
- Introduction to human-machine interfaces (HMI) and dashboards.
- Troubleshooting communication issues.
- Cybersecurity basics for HVAC networks.
- Practical: reading and interpreting a control schematic.

Day 3: Programming and Configuration of HVAC Controllers

- Introduction to controller programming software.
- Ladder logic and function block programming.
- Configuring analog and digital inputs/outputs.
- PID tuning: proportional band, integral time, derivative time.
- Control sequences: morning warm-up, night setback, demand-controlled ventilation.
- Alarm handling and logging.
- Commissioning and testing control programs.
- Practical: programming a simple temperature control loop.

Day 4: Advanced Control Strategies and Energy Optimization

- Advanced strategies: optimal start/stop, economizer control, demand response.
- Energy optimization: variable air volume (VAV) control, chilled water reset.
- Data analytics: trend logging, performance dashboards.
- Fault detection: identifying sensor drift, stuck actuators, valve leakage.
- Commissioning and retro-commissioning processes.
- Integration with renewable energy systems.
- Practical: analyzing trend data to optimize a chiller plant.
- Case study: energy savings through control improvements.

Day 5: Integration, Troubleshooting, and System Commissioning

- System integration: APIs, gateways, and interoperability.
- Troubleshooting methodology: systematic approach, tools (multimeter, laptop).
- Common faults: communication failures, sensor errors, actuator jams.
- Commissioning: checklists, functional testing, performance verification.
- Documentation: as-built drawings, sequence of operations, O&M; manuals.

- Preventative maintenance for controllers and field devices.
- Future trends: IoT, cloud-based controls, AI in HVAC.
- Practical: commissioning a small HVAC control system.

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-0251) 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