



## 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

# HVAC Fundamentals

Custom Courses / Engineering & Technical Maintenance

Unit Standard AATICD-0248 · NQF Level 5 · 10 Credits · 5 Days

## COURSE OVERVIEW

This course provides a comprehensive introduction to HVAC fundamentals, covering core principles of heating, ventilation, and air conditioning systems. Participants will gain the knowledge and skills necessary to understand, operate, and maintain basic HVAC systems safely and efficiently.

|                 |                                            |
|-----------------|--------------------------------------------|
| Category        | Custom Courses                             |
| Subfield        | Engineering & Technical Maintenance        |
| Unit Standard   | AATICD-0248                                |
| 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

- Explain the fundamental principles of thermodynamics, heat transfer, and psychrometrics as they apply to HVAC systems.
- Identify and describe the major components of HVAC systems, including compressors, condensers, evaporators, and expansion devices.
- Apply safety procedures and regulations relevant to HVAC installation, maintenance, and repair.
- Demonstrate the ability to read and interpret basic HVAC system diagrams and schematics.
- Analyze common HVAC system performance parameters and troubleshoot basic operational issues.

## WHO SHOULD ATTEND

- This course is designed for technicians, maintenance personnel, and entry-level engineers who are new to the HVAC field or require a solid foundation in HVAC principles.

## COURSE OUTLINE

### Day 1: Introduction to HVAC Systems

- Overview of HVAC and its importance
- Basic thermodynamics and heat transfer
- The refrigeration cycle (compression, condensation, expansion, evaporation)
- Main components: compressor, condenser, evaporator, expansion valve
- Types of systems: split, packaged, ducted, ductless
- Introduction to refrigerants and environmental considerations

### Day 2: System Components and Functions

- Compressors: reciprocating, scroll, screw, centrifugal
- Condensers: air-cooled, water-cooled, evaporative
- Evaporators: types and applications
- Metering devices: TXV, capillary tube, orifice
- Air distribution: fans, ductwork, grilles, diffusers
- Controls: thermostats, pressure switches, safeties

### Day 3: Refrigerants and System Performance

- Refrigerant types: CFCs, HCFCs, HFCs, HFOs, natural refrigerants
- Environmental regulations (Montreal Protocol, Kigali Amendment)
- Pressure-enthalpy diagrams and the refrigeration cycle
- Superheat and subcooling measurement and significance
- Performance metrics: EER, COP, SEER, IPLV
- Common system faults: low charge, restrictions, non-condensables

### Day 4: Electrical and Control Systems

- Electrical fundamentals: voltage, current, resistance, power
- Wiring diagrams and schematic symbols
- Components: contactors, relays, capacitors, transformers
- Control sequences: cooling, heating, defrost
- Troubleshooting: measuring voltage, current, resistance
- Introduction to building management systems (BMS) and smart thermostats

### Day 5: Installation, Maintenance, and Safety

- Safety: PPE, lockout/tagout, refrigerant handling, electrical safety
- Installation: site preparation, mounting, piping, electrical connections
- Maintenance: cleaning coils, replacing filters, checking refrigerant charge
- Troubleshooting: systematic approach, using gauges and meters
- Commissioning: system start-up, performance verification, documentation
- Career paths and professional development in HVAC

## 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                    |
|-------------|-------------|-----------|--------------------------|
| 03 Aug 2026 | 07 Aug 2026 | On-Campus | Pretoria, South Africa   |
| 03 Aug 2026 | 07 Aug 2026 | On-Campus | Dubai, UAE               |
| 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 |

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](http://www.aaticd.co.za), open the page for this course (Unit Standard AATICD-0248) 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](mailto: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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