



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 Design and Engineering

Custom Courses / Engineering & Technical Maintenance

Unit Standard AATICD-0250 · NQF Level 5 · 10 Credits · 5 Days

COURSE OVERVIEW

This course provides participants with the fundamental principles and practical skills required to design and engineer HVAC systems for commercial and industrial applications. It covers load calculations, equipment selection, ductwork design, and system optimization to ensure energy efficiency and compliance with South African building regulations.

Category	Custom Courses
Subfield	Engineering & Technical Maintenance
Unit Standard	AATICD-0250
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 psychrometric principles to analyze air properties and processes for HVAC design.
- Calculate heating and cooling loads using industry-standard methods (e.g., ASHRAE, CIBSE).
- Design ductwork and piping systems for efficient air and fluid distribution.
- Select appropriate HVAC equipment (chillers, boilers, air handlers) based on performance criteria.
- Evaluate system performance and energy efficiency using metrics like EER and COP.
- Demonstrate compliance with SANS 10400 and relevant safety standards in HVAC design.

WHO SHOULD ATTEND

- This course is ideal for mechanical engineers, building services technicians, and facilities managers seeking to specialize in HVAC design.
- It is also suitable for recent graduates in engineering who wish to gain applied knowledge in HVAC systems.

COURSE OUTLINE

Day 1: Fundamentals of HVAC Systems

- Overview of HVAC industry and standards in South Africa
- Basic thermodynamics: heat transfer, refrigeration cycle
- Psychrometrics: properties of moist air, psychrometric chart
- HVAC system components: compressors, condensers, evaporators, expansion devices
- System types: split systems, packaged units, VRF, chilled water systems
- Introduction to heating and cooling load calculations
- Indoor air quality and ventilation basics

Day 2: HVAC Design Principles and Load Calculations

- Manual J and other load calculation methods (SANS 10400-O
- Equipment selection: capacity, efficiency, and sizing
- Duct design: pressure loss, duct sizing (equal friction, static regain
- Pipe sizing for chilled water and refrigerant systems
- Zoning strategies and thermostat placement
- Introduction to building management systems (BMS) and controls

Day 3: Advanced System Design and Energy Efficiency

- VRF system design: piping, branching, and controls
- Chilled water system design: chillers, cooling towers, pumps
- Energy efficiency: EER, COP, IPLV, and building energy codes
- Renewable integration: solar-assisted HVAC, geothermal heat pumps
- Refrigeration system design for cold storage and supermarkets
- Heat recovery and economizer cycles

Day 4: HVAC System Installation, Commissioning, and Maintenance

- Installation standards: SANS 10147, SANS 10153
- Commissioning process: testing, balancing, verification
- Preventive maintenance: filters, coils, fans, pumps
- Troubleshooting: electrical, mechanical, and control issues
- Refrigerant handling: recovery, recycling, and regulations
- Safety: electrical safety, confined spaces, working at heights

Day 5: Project Management, Codes, and Professional Practice

- Project management: scope, schedule, budget, and quality
- Building codes: SANS 10400, SANS 10160, and local by-laws
- Technical documentation: design reports, drawings, schedules
- Life cycle cost analysis and total cost of ownership
- Sustainability: green building rating tools (Green Star, EDGE
- Professional ethics and continuing professional development

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-0250) 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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