



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

Belt Drives Couplings Gearboxes Bearings Air Conditioning Refrigeration Ventilation Maintenance Training

Manufacturing, Engineering and Technology / Manufacturing and Assembly

Unit Standard 116233 · NQF Level 2 · 6 Credits · 3 Days

COURSE OVERVIEW

This course equips maintenance personnel with the knowledge and skills to inspect, maintain, and troubleshoot belt drives, couplings, gearboxes, bearings, air conditioning, refrigeration, and ventilation systems. Participants will learn to apply preventive maintenance techniques, diagnose common faults, and ensure optimal performance and safety of these mechanical and HVAC systems in industrial settings.

Category	Manufacturing, Engineering and Technology
Subfield	Manufacturing and Assembly
Unit Standard	116233
Accreditation	SAQA Accredited · NQF Level 2 · 6 Credits
Duration	3 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Apply inspection procedures to assess the condition of belt drives, couplings, gearboxes, and bearings.
- Demonstrate correct lubrication and alignment techniques for gearboxes and bearings.
- Analyze common faults in air conditioning, refrigeration, and ventilation systems and implement corrective actions.
- Evaluate the performance of belt drives and couplings using tension and wear measurement tools.
- Implement preventive maintenance schedules for HVAC and mechanical drive components.
- Design basic troubleshooting flowcharts for integrated mechanical and refrigeration systems.

WHO SHOULD ATTEND

- This course is designed for maintenance technicians, millwrights, artisans, and engineers responsible for the upkeep of mechanical and HVAC systems in manufacturing, mining, and commercial facilities.

COURSE OUTLINE

Day 1: Fundamentals of Mechanical Power Transmission and HVAC Systems

- Introduction to mechanical power transmission: belt drives (V-belts, timing belts), couplings (flexible, rigid), gearboxes (types, ratios), and bearings (ball, roller, plain).
- Principles of HVAC: refrigeration cycle (compressor, condenser, evaporator, expansion valve), air conditioning (cooling, dehumidification), ventilation (fans, ductwork).
- Safety procedures for working with rotating machinery and refrigerants.
- Practical: visual inspection of belt tension, alignment, and wear; coupling alignment checks using straightedge and feeler gauge.
- Lubrication fundamentals for bearings and gearboxes.

Day 2: Intermediate Maintenance and Troubleshooting of Drives and HVAC Components

- Belt drive maintenance: tension measurement (force deflection method), alignment (pulley parallelism), replacement procedures.
- Gearbox maintenance: oil level checks, contamination analysis, gear wear patterns, and seal replacement.
- Bearing maintenance: mounting/dismounting techniques, clearance adjustment, and failure analysis (pitting, spalling).
- HVAC service: cleaning condenser coils, checking refrigerant pressures (high/low side), leak testing with electronic detector.
- Ventilation maintenance: fan belt tension, bearing greasing, duct cleaning, and airflow measurement.
- Practical exercises: belt tensioning and alignment, gearbox oil change, bearing replacement on a pillow block.

Day 3: Advanced Diagnostics, Integration, and System Optimization

- Advanced condition monitoring: vibration analysis (FFT interpretation), thermography (hot spots in bearings, electrical connections), oil analysis (particle count, viscosity).
- Troubleshooting case studies: belt slip causing overheating, coupling misalignment leading to bearing failure, gearbox noise diagnosis.
- HVAC system optimization: superheat and subcooling measurement, expansion valve adjustment, refrigerant charge correction.
- Ventilation system balancing: damper adjustment, fan speed control (VFD), static pressure measurement.
- Practical: conduct a full system audit on a combined drive-HVAC setup, interpret data, and propose maintenance actions.
- Developing a maintenance plan: frequency tables, spare parts identification, and documentation using CMMS principles.

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 **6 NQF credits** at **NQF Level 2**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 17,900.00	R 17,900.00
1	In-House	R 23,300.00	R 23,300.00
1	On-Campus (Pretoria)	R 26,800.00	R 26,800.00

UPCOMING SESSIONS

Start	End	Method	Venue
04 Aug 2026	06 Aug 2026	On-Campus	Pretoria, South Africa
04 Aug 2026	06 Aug 2026	On-Campus	Mauritius
05 Aug 2026	07 Aug 2026	On-Campus	Cape Town, South Africa
05 Aug 2026	07 Aug 2026	On-Campus	Lagos, Nigeria
10 Aug 2026	12 Aug 2026	On-Campus	Pretoria, South Africa
10 Aug 2026	12 Aug 2026	On-Campus	Mauritius
11 Aug 2026	13 Aug 2026	On-Campus	Abu Dhabi, UAE
11 Aug 2026	13 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 116233) 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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