



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

Centrifugal Pump Maintenance and Operation

Manufacturing, Engineering and Technology / Manufacturing and Assembly

Unit Standard 253391 · NQF Level 3 · 14 Credits · 11 Days

COURSE OVERVIEW

This course equips learners with the practical skills and theoretical knowledge required to safely maintain and operate centrifugal pumps in industrial settings. Participants will learn to perform routine inspections, diagnose common faults, and execute maintenance procedures in compliance with manufacturer specifications and safety standards.

Category	Manufacturing, Engineering and Technology
Subfield	Manufacturing and Assembly
Unit Standard	253391
Accreditation	SAQA Accredited · NQF Level 3 · 14 Credits
Duration	11 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Demonstrate the ability to safely isolate and prepare a centrifugal pump for maintenance according to lockout/tagout procedures.
- Apply systematic inspection techniques to identify wear, misalignment, and other common faults in pump components.
- Analyze pump performance data to determine operational efficiency and diagnose potential issues.
- Implement maintenance procedures including bearing replacement, seal adjustment, and impeller clearance checks.
- Evaluate the condition of pump components and recommend corrective actions to extend equipment life.
- Document maintenance activities and report findings in accordance with workplace protocols.

WHO SHOULD ATTEND

- This course is designed for maintenance technicians, plant operators, and engineering staff responsible for the upkeep and operation of centrifugal pumps in manufacturing, water treatment, and process industries.

COURSE OUTLINE

Day 1: Introduction to Centrifugal Pumps and Safety

- Overview of centrifugal pump principles
- Main components: impeller, casing, shaft, bearings, seals
- Pump classifications and applications
- Safety regulations and personal protective equipment
- Hazard identification and risk assessment
- Lock-out/tag-out procedures
- Introduction to pump curves

Day 2: Pump Hydraulics and Performance Curves

- Hydraulic principles: head, flow, NPSH
- Reading and plotting pump curves
- System curve and duty point determination
- Affinity laws and their applications
- Specific speed and pump selection
- Efficiency and power consumption

Day 3: Pump Components and Mechanical Seals

- Detailed component review: impeller types, volute, diffuser
- Bearings: types, lubrication, and failure analysis
- Mechanical seals vs gland packing
- Seal flush plans and cooling systems
- Seal installation procedures
- Common seal failure causes

Day 4: Pump Drivers and Couplings

- AC induction motors: principles and ratings
- Coupling types: flexible, rigid, fluid
- Shaft alignment methods: dial indicator, laser
- V-belt drives and tensioning
- Variable frequency drives (VFD) basics
- Motor protection and starting methods

Day 5: Pump Installation and Commissioning

- Foundation and baseplate requirements
- Piping connections and stress avoidance
- Pre-commissioning checklist
- Initial start-up procedures
- Performance testing and data logging
- Commissioning documentation

Day 6: Routine Operation and Monitoring

- Daily operational checks: flow, pressure, temperature
- Vibration monitoring basics
- Temperature and noise analysis
- Lubrication schedules and oil analysis

- Logbook keeping and trend analysis
- Operating within pump curve limits

Day 7: Preventive Maintenance Planning

- Preventive vs reactive maintenance
- Maintenance schedule development
- Bearing replacement procedures
- Seal replacement procedures
- Impeller and wear ring inspection
- Maintenance record keeping

Day 8: Troubleshooting and Fault Diagnosis

- Common faults: low flow, noise, vibration, leakage
- Troubleshooting flowcharts
- Root cause analysis techniques
- Bearing fault diagnosis
- Seal leakage analysis
- Cavitation detection and prevention

Day 9: Pump Overhaul and Repair

- Overhaul planning and tooling
- Disassembly sequence and component inspection
- Clearance measurements and adjustments
- Reassembly procedures and torque specifications
- Post-overhaul testing
- Spare parts management

Day 10: Advanced Topics and Energy Efficiency

- Energy efficiency calculations
- Pump system optimisation
- Variable speed drive applications
- Condition monitoring: vibration analysis, thermography
- Life cycle cost analysis
- Regulatory and environmental considerations

Day 11: Integrated Practical Assessment and Review

- Integrated practical assessment
- Pump inspection and reporting
- Fault simulation and resolution
- Documentation and handover
- Course review and Q&A;
- Final assessment and feedback

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 **14 NQF credits** at **NQF Level 3**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 38,400.00	R 38,400.00
1	In-House	R 49,900.00	R 49,900.00
1	On-Campus (Pretoria)	R 57,600.00	R 57,600.00

UPCOMING SESSIONS

Start	End	Method	Venue
03 Aug 2026	17 Aug 2026	On-Campus	Johannesburg, South Africa
04 Aug 2026	18 Aug 2026	On-Campus	Mauritius
05 Aug 2026	19 Aug 2026	On-Campus	Cape Town, South Africa
06 Aug 2026	20 Aug 2026	On-Campus	Dubai, UAE
07 Aug 2026	21 Aug 2026	On-Campus	Pretoria, South Africa
07 Aug 2026	21 Aug 2026	On-Campus	Lagos, Nigeria
10 Aug 2026	24 Aug 2026	On-Campus	Durban, South Africa
10 Aug 2026	24 Aug 2026	On-Campus	Mauritius

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 253391) 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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