



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

Gas Turbines: Operation, Technology and Troubleshooting

Manufacturing, Engineering and Technology / Manufacturing and Assembly

Unit Standard 116416 · NQF Level 4 · 4 Credits · 4 Days

COURSE OVERVIEW

This course equips control room operators with the knowledge and skills to manage load variations on gas turbine power generating systems safely and efficiently. Participants will learn to monitor, adjust, and stabilize turbine output in response to changing grid demands, ensuring optimal performance and compliance with safety standards.

Category	Manufacturing, Engineering and Technology
Subfield	Manufacturing and Assembly
Unit Standard	116416
Accreditation	SAQA Accredited · NQF Level 4 · 4 Credits
Duration	4 days
Training Method	On-Campus
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Analyze load variation signals and determine appropriate control actions.
- Apply control strategies to adjust fuel flow and inlet guide vanes for stable turbine output.
- Monitor turbine parameters and diagnose deviations from set points.
- Implement emergency procedures to handle sudden load changes or system faults.
- Evaluate the impact of load variations on turbine efficiency and emissions.
- Demonstrate compliance with safety protocols and operational procedures.

WHO SHOULD ATTEND

- Control room operators, power plant technicians, and engineers responsible for gas turbine operations in power generation facilities.

COURSE OUTLINE

Day 1: Gas Turbine Fundamentals and Thermodynamics

- Introduction to gas turbines: history and applications
- Basic thermodynamics: Brayton cycle, efficiency, and power output
- Major components: compressor, combustor, turbine, and auxiliaries
- Types of gas turbines: heavy-duty, aero-derivative, and micro-turbines
- Performance parameters: pressure ratio, turbine inlet temperature, and specific fuel consumption
- Overview of gas turbine systems: fuel, lubrication, and control

Day 2: Gas Turbine Operation and Control Systems

- Start-up sequence: purging, ignition, acceleration, and synchronisation
- Load control: speed and temperature control loops
- Monitoring systems: vibration, temperature, and pressure sensors
- Fuel systems: liquid and gaseous fuel handling, fuel nozzles, and combustion
- Emission control: dry low NOx, water/steam injection
- Operational limitations: surge margin, exhaust gas temperature limits, and life consumption

Day 3: Troubleshooting and Maintenance Strategies

- Troubleshooting process: data collection, analysis, and root cause identification
- Common faults: compressor surge, combustion instability, hot gas path damage
- Vibration analysis: spectrum interpretation and balancing
- Oil analysis and borescope inspection
- Maintenance planning: interval determination and task prioritisation
- Case studies: real-world troubleshooting scenarios

Day 4: Advanced Topics and Practical Integration

- Combined cycle and cogeneration: heat recovery steam generators and efficiency
- Digitalisation: IoT, predictive analytics, and digital twins
- Life extension: refurbishment, upgrades, and repowering
- Safety systems: fire and gas detection, emergency shutdown
- Environmental compliance: emissions monitoring and reporting
- Final assessment: integrated case study and group discussion

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 **4 NQF credits** at **NQF Level 4**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 20,500.00	R 20,500.00
1	In-House	R 26,600.00	R 26,600.00
1	On-Campus (Pretoria)	R 30,800.00	R 30,800.00

UPCOMING SESSIONS

Start	End	Method	Venue
04 Aug 2026	04 Aug 2026	On-Campus	Dubai, UAE
05 Aug 2026	05 Aug 2026	On-Campus	Pretoria, South Africa
06 Aug 2026	06 Aug 2026	On-Campus	Johannesburg, South Africa
07 Aug 2026	07 Aug 2026	On-Campus	Mauritius
10 Aug 2026	10 Aug 2026	On-Campus	Dubai, UAE
11 Aug 2026	11 Aug 2026	On-Campus	Pretoria, South Africa
12 Aug 2026	12 Aug 2026	On-Campus	Abu Dhabi, UAE
13 Aug 2026	13 Aug 2026	On-Campus	Durban, 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 116416) 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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