



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

Spark Erosion Machining Operations for Component Production

Manufacturing, Engineering and Technology / Manufacturing and Assembly

Unit Standard 258715 · NQF Level 3 · 8 Credits · 5 Days

COURSE OVERVIEW

This course equips learners with the skills and knowledge to safely and effectively produce components using spark eroding machining operations. It covers machine setup, electrode selection, erosion parameters, and quality inspection to ensure precision component manufacturing. The course emphasizes adherence to safety protocols and industry standards in a workshop environment.

Category	Manufacturing, Engineering and Technology
Subfield	Manufacturing and Assembly
Unit Standard	258715
Accreditation	SAQA Accredited · NQF Level 3 · 8 Credits
Duration	5 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Demonstrate safe working practices and procedures when setting up and operating spark erosion machines.
- Apply appropriate electrode materials and geometries for specific component production tasks.
- Analyze erosion parameters (current, pulse duration, voltage) to optimize material removal and surface finish.
- Evaluate component quality using measuring instruments and compare against specified tolerances.
- Implement corrective actions to adjust machine settings based on inspection results.
- Design a simple spark erosion machining sequence for a given component drawing.

WHO SHOULD ATTEND

- This course is designed for machinists, toolmakers, and production technicians who operate or supervise spark erosion machines in manufacturing or engineering environments.
- It is also suitable for apprentices and experienced operators seeking formal recognition of their skills.

COURSE OUTLINE

Day 1: Introduction to Spark Erosion Machining

- Overview of EDM and its applications in component production
- Principles of electrical discharge machining
- Machine components: power supply, workhead, dielectric system
- Electrode materials: copper, graphite, tungsten
- Dielectric fluids: types, functions, and filtration
- Safety procedures: electrical hazards, fire prevention, PPE
- Introduction to process parameters: voltage, current, pulse duration
- Comparison with conventional machining methods

Day 2: Machine Setup and Parameter Selection

- Workpiece preparation and clamping techniques
- Electrode selection and mounting procedures
- Setting machining parameters: gap voltage, peak current, pulse on/off time
- Dielectric system setup: flushing methods, pressure, filtration
- Machine calibration and alignment checks
- Parameter selection for roughing and finishing cuts
- Factors affecting material removal rate and surface finish
- Documentation of setup procedures

Day 3: Machining Operations and Process Control

- Cavity sinking operations: roughing, finishing, and orbiting
- Through-hole machining with tubular electrodes
- Monitoring spark gap and arc detection
- Adaptive control: adjusting parameters in real-time
- Common defects: recast layer, electrode wear, taper
- Troubleshooting: short circuits, unstable machining
- Process optimization: balancing speed and accuracy
- Quality checks: surface roughness measurement

Day 4: Advanced EDM Techniques and Quality Assurance

- Introduction to wire EDM: principles and applications
- Micro-EDM for precision components
- Surface integrity: heat-affected zone, recast layer, microcracks
- Inspection methods: profilometry, CMM, optical microscopy
- Dimensional and geometric tolerances
- Statistical process control (SPC) basics
- Documentation and traceability
- Case studies: aerospace, medical, tool and die

Day 5: Integration, Maintenance, and Certification Preparation

- Production planning: sequencing EDM with other processes
- Workflow optimization: setup reduction, tooling management
- Preventive maintenance: cleaning, filter replacement, calibration
- Troubleshooting common machine faults
- Review of unit standard outcomes and assessment criteria

- Mock practical assessment
- Final Q&A; and course evaluation
- Certification requirements and next steps

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 **8 NQF credits** at **NQF Level 3**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 23,000.00	R 23,000.00
1	In-House	R 29,900.00	R 29,900.00
1	On-Campus (Pretoria)	R 34,500.00	R 34,500.00

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
10 Aug 2026	14 Aug 2026	On-Campus	Pretoria, South Africa
10 Aug 2026	14 Aug 2026	On-Campus	Dubai, UAE
10 Aug 2026	14 Aug 2026	On-Campus	Cape Town, South Africa
10 Aug 2026	14 Aug 2026	On-Campus	Mauritius
17 Aug 2026	21 Aug 2026	On-Campus	Dubai, UAE
17 Aug 2026	21 Aug 2026	On-Campus	Pretoria, 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 258715) 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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