



Accredited Africa Training Institute for Capacity Development

Unit FO409, Hatfield Plaza · 1122 Burnett St, Hatfield 0028 · Pretoria, Gauteng · South Africa

Tel: +27 12 004 8389 · Mobile: +27 65 077 6310

Email: apply@aatikd.co.za · Website: www.aatikd.co.za

COURSE BROCHURE

Milling Operations for Component Production

Manufacturing, Engineering and Technology / Manufacturing and Assembly

Unit Standard 258718 · NQF Level 3 · 16 Credits · 13 Days

COURSE OVERVIEW

This course equips learners with the practical skills and theoretical knowledge required to safely and efficiently produce components using milling machines. It covers setup, operation, and quality control procedures essential for manufacturing precision parts.

Category	Manufacturing, Engineering and Technology
Subfield	Manufacturing and Assembly
Unit Standard	258718
Accreditation	SAQA Accredited · NQF Level 3 · 16 Credits
Duration	13 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Demonstrate safe working practices when setting up and operating milling machines.
- Interpret engineering drawings and specifications to determine milling requirements.
- Select and install appropriate cutting tools, workholding devices, and machine parameters.
- Perform milling operations to produce components within specified tolerances.
- Inspect finished components using measuring instruments and verify conformance to specifications.
- Apply quality control procedures and document production outcomes.

WHO SHOULD ATTEND

- This course is designed for machine operators, artisans, and technicians in manufacturing or engineering environments who need to perform milling operations as part of component production.

COURSE OUTLINE

Day 1: Introduction to Milling Operations

- Overview of milling and its applications
- Types of milling machines (vertical, horizontal)
- Key components: spindle, table, column, knee
- Safety equipment and procedures
- Introduction to cutting tools and workholding
- Basic milling operations: face milling, peripheral milling

Day 2: Milling Machine Setup and Workholding

- Machine setup checklist
- Workholding options: vises, clamps, fixtures
- Workpiece alignment methods
- Calculating cutting speeds and feeds
- Tool selection and mounting
- Lubrication and coolant systems

Day 3: Cutting Tools and Tooling

- Cutter types: end mills, face mills, slab mills
- Cutter materials: HSS, carbide, coatings
- Cutter geometry: rake, clearance, helix angles
- Tool holders and collets
- Tool inspection and replacement criteria
- Tool life and wear factors

Day 4: Speeds, Feeds, and Cutting Parameters

- Speed and feed formulas
- Material considerations (steel, aluminium, plastics)
- Depth of cut strategies
- Chip thinning and load per tooth
- Surface finish requirements
- Using machining data handbooks

Day 5: Basic Milling Operations – Facing and Slab Milling

- Facing cutter selection and setup
- Step-by-step facing procedure
- Slab milling with horizontal mills
- Climb vs conventional milling
- Measuring flatness and parallelism
- Troubleshooting surface defects

Day 6: Slot and Keyway Milling

- Slot milling techniques
- Keyway cutting methods (Woodruff, square)
- End mill selection for slots
- Depth control and multiple passes
- Measuring slot width and depth

- Checking key fit and tolerances

Day 7: Drilling, Boring, and Reaming on Milling Machines

- Drill chucks and drill bits
- Boring heads and bars
- Reaming allowances and speeds
- Hole location methods
- Using edge finders and indicators
- Inspection of hole geometry

Day 8: Angular and Dovetail Milling

- Angle plates and sine bars
- Tilting head and universal vise
- Dovetail cutter geometry
- Dovetail milling procedure
- Using protractors and gauges
- Dovetail measurement techniques

Day 9: Indexing and Rotary Table Operations

- Direct and simple indexing
- Dividing head components and setup
- Rotary table operation
- Milling arcs and circles
- Indexing for gear teeth
- Compound indexing calculations

Day 10: Thread Milling and Helical Milling

- Thread milling vs tapping
- Single-point and multi-point thread mills
- Helical interpolation basics
- Manual thread milling techniques
- Thread inspection with gauges
- Helical milling for spiral features

Day 11: Advanced Techniques – Contour and Profile Milling

- Contour milling strategies
- Profile milling with templates
- Roughing vs finishing passes
- Tool path optimization
- Using copy milling attachments
- Inspection of contoured surfaces

Day 12: Quality Control and Inspection in Milling

- Micrometers, callipers, indicators
- Surface roughness measurement
- GD&T; symbols and tolerances
- In-process gauging techniques
- Common milling defects and causes
- Inspection reports and traceability

Day 13: Integration, Troubleshooting, and Final Assessment

- Capstone milling project
- Troubleshooting vibration, chatter, and tool breakage
- Process optimization techniques
- Review of key concepts
- Final practical assessment
- Course summary and certification

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 **16 NQF credits** at **NQF Level 3**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 43,500.00	R 43,500.00
1	In-House	R 56,600.00	R 56,600.00
1	On-Campus (Pretoria)	R 65,200.00	R 65,200.00

UPCOMING SESSIONS

Start	End	Method	Venue
04 Aug 2026	20 Aug 2026	On-Campus	Johannesburg, South Africa
05 Aug 2026	21 Aug 2026	On-Campus	Mauritius
06 Aug 2026	24 Aug 2026	On-Campus	Cape Town, South Africa
07 Aug 2026	25 Aug 2026	On-Campus	Dubai, UAE
10 Aug 2026	26 Aug 2026	On-Campus	Abu Dhabi, UAE
11 Aug 2026	27 Aug 2026	On-Campus	Durban, South Africa
11 Aug 2026	27 Aug 2026	On-Campus	Mauritius
12 Aug 2026	28 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 258718) 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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