



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

Material Machining and Specialist Tool Use

Physical Planning and Construction / Building Construction

Unit Standard 230061 · NQF Level 2 · 14 Credits · 11 Days

COURSE OVERVIEW

This course equips learners with the practical skills and theoretical knowledge required to machine materials using specialist tools in a manufacturing or engineering environment. Learners will gain competence in setting up, operating, and maintaining machining equipment while adhering to safety standards and quality specifications.

Category	Physical Planning and Construction
Subfield	Building Construction
Unit Standard	230061
Accreditation	SAQA Accredited · NQF Level 2 · 14 Credits
Duration	11 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Apply safe working practices and use personal protective equipment during machining operations.
- Set up and operate machining equipment (e.g., lathes, milling machines, grinders) to produce components within specified tolerances.
- Select and use specialist tools (e.g., cutting tools, measuring instruments, jigs and fixtures) appropriate for the material and machining process.
- Analyze machining parameters such as speed, feed, and depth of cut to optimize material removal and surface finish.
- Inspect finished components using precision measuring instruments and verify compliance with engineering drawings and specifications.
- Perform routine maintenance and basic troubleshooting on machining equipment and specialist tools.

COURSE OUTLINE

Day 1: Introduction to Material Machining and Safety

- Overview of machining processes and specialist tools
- Occupational Health and Safety (OHS) Act requirements
- PPE selection and inspection
- Hazard identification and risk assessment (HIRA)
- Fire safety and first aid basics
- Workshop layout and safe material handling

Day 2: Measurement and Marking-Out Techniques

- Vernier callipers, micrometers, and gauges
- Surface plates, scribes, and dividers
- Datum lines, centre lines, and layout fluid
- Reading dimensions and tolerances on drawings
- Tool care and calibration checks
- Practical exercise: marking out a component

Day 3: Hand Tools for Material Removal

- Hacksaws, files, and chisels
- Taps, dies, and tap wrenches
- Deburring and finishing techniques
- Tool sharpening basics
- Safe cutting angles and pressure
- Practical: cutting and threading a rod

Day 4: Power Tools – Drills and Saws

- Types of drills: pistol grip, magnetic, and pillar drills
- Drill bit geometry and materials
- Reciprocating and circular saws
- Clamping workpieces and controlling kickback
- Coolant and chip removal
- Practical: drilling and cutting steel and aluminium

Day 5: Grinding and Abrasive Processes

- Bench and pedestal grinders
- Abrasive types: aluminium oxide, silicon carbide
- Wheel dressing with diamond tools
- Grinding angles for lathe tools
- Safety guards and eye protection
- Practical: sharpening a lathe tool

Day 6: Engine Lathe Operations – Fundamentals

- Lathe parts: headstock, tailstock, carriage
- Three-jaw and four-jaw chucks
- Cutting tool geometry and tool posts
- Speed and feed calculations
- Coolant application

- Practical: turning a stepped shaft

Day 7: Engine Lathe – Threading and Taper Turning

- Thread cutting gear selection
- Tool bit grinding for threads
- Taper attachment setup
- Compound rest method
- Thread measurement and fit testing
- Practical: cutting a metric thread

Day 8: Milling Machine Operations

- Vertical and horizontal milling machines
- Arbor, collet, and end mill holders
- Up-cut vs down-cut milling
- Cutting fluid application
- Workpiece alignment and tramming
- Practical: milling a keyway

Day 9: Specialist Tools – Taps, Dies, Reamers, and Broaches

- Hand taps: taper, plug, bottoming
- Die stocks and adjustable dies
- Reamer types and reaming allowances
- Broaching tools and setups
- Cutting fluids for specialist tools
- Practical: reaming a precision hole

Day 10: CNC Machining – Introduction and Setup

- CNC lathe and mill basics
- G-code and M-code fundamentals
- Tool length and diameter offsets
- Work coordinate systems (G54, etc.
- Dry run and single block operation
- Practical: running a simple CNC program

Day 11: Integration, Quality Control, and Final Assessment

- Project: manufacture a component from drawing
- Use of CMM, micrometers, and go/no-go gauges
- Non-conformance reporting
- Tool wear monitoring
- Course review and theory assessment
- Final practical assessment

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 2**.

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
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
11 Aug 2026	25 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 230061) 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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