Accredited Africa Training Institute for Capacity Development
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COURSE BROCHURE

# Production Tooling Maintenance and Repair

Manufacturing, Engineering and Technology / Manufacturing and Assembly

Unit Standard 13257 · NQF Level 3 · 20 Credits · 17 Days

## COURSE OVERVIEW

This course equips learners with the skills to maintain and repair production tooling, ensuring optimal performance and longevity. Participants will learn systematic diagnostic techniques, preventive maintenance procedures, and safe repair practices to minimize downtime and enhance productivity.

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|---|---|
| Category | Manufacturing, Engineering and Technology |
| Subfield | Manufacturing and Assembly |
| Unit Standard | 13257 |
| Accreditation | SAQA Accredited · NQF Level 3 · 20 Credits |
| Duration | 17 days |
| Training Method | Online, On-Campus, In-House |
| Certificate | Issued via AATICD LMS — verifiable online |

## LEARNING OUTCOMES

- Apply systematic procedures to inspect production tooling for wear and damage.
- Demonstrate correct techniques for cleaning, lubricating, and adjusting tooling components.
- Diagnose common faults in production tooling using appropriate testing equipment.
- Implement repair procedures to restore tooling to operational specifications.
- Evaluate the effectiveness of maintenance and repair actions through performance checks.
- Document maintenance activities and tooling condition reports in compliance with workplace standards.

## WHO SHOULD ATTEND

- This course is designed for maintenance technicians, toolmakers, and production operators responsible for the upkeep of tooling in manufacturing environments.

## COURSE OUTLINE

### Day 1: Introduction to Production Tooling and Maintenance Principles

- Overview of production tooling: dies, jigs, fixtures, moulds.
- Maintenance concepts: preventive, predictive, corrective.
- Safety regulations and personal protective equipment (PPE).
- Introduction to tool life and wear mechanisms.
- Documentation and record-keeping for maintenance.
- Basic workshop practices and housekeeping.

### Day 2: Tool Materials and Their Properties

- Ferrous and non-ferrous metals in tooling.
- Hardness, toughness, and wear resistance.
- Heat treatment: annealing, hardening, tempering.
- Surface treatments: coatings, nitriding.
- Material selection criteria for tooling.
- Inspection of material defects.

### Day 3: Tooling Design and Drawing Interpretation

- Types of engineering drawings: assembly, detail.
- Symbols, abbreviations, and title blocks.
- Limits, fits, and surface finish specifications.
- GD&T;: flatness, parallelism, concentricity.
- Design for maintenance: accessibility, modularity.
- Practical exercise: interpreting a simple die drawing.

### Day 4: Measuring and Inspection Tools

- Calipers, micrometers, dial indicators.
- Surface plates, height gauges, and sine bars.
- Optical comparators and CMM basics.
- Non-destructive testing: dye penetrant, magnetic particle.
- Measurement uncertainty and calibration.
- Practical: measuring a jig component.

### Day 5: Lubrication and Cooling Systems

- Types of lubricants: oils, greases, solid lubricants.
- Lubrication methods: manual, automatic, centralized.
- Coolants: water-soluble, oils, and their properties.
- Filtration and contamination control.
- Lubrication schedules and records.
- Safety with lubricants and coolants.

### Day 6: Mechanical Fasteners and Joining Techniques

- Bolts, screws, pins, keys, and retaining rings.
- Torque specifications and tightening sequences.
- Thread repair: taps, dies, helicoils.
- Welding processes: TIG, MIG, stick.
- Brazing and soldering for tooling.

- Safety in welding and fastening.

Day 7: Hydraulic and Pneumatic Systems in Tooling

- Hydraulic fluids and filters.
- Pneumatic air preparation: FRL units.
- Actuators: single/double-acting cylinders.
- Directional control valves and flow controls.
- Seals, hoses, and fittings.
- Practical: disassemble and reassemble a pneumatic cylinder.

Day 8: Electrical and Control Systems in Tooling

- Relays, contactors, and motor starters.
- Proximity and limit switches.
- PLC basics for tooling control.
- Wiring diagrams and colour codes.
- Troubleshooting electrical faults.
- Safety: lockout/tagout procedures.

Day 9: Preventive Maintenance Planning and Scheduling

- PM principles: time-based, usage-based.
- Developing PM checklists.
- Maintenance planning: spare parts, tools, labour.
- CMMS (Computerized Maintenance Management System).
- Key performance indicators: MTBF, MTTR.
- Practical: create a PM schedule for a die.

Day 10: Troubleshooting and Root Cause Analysis

- Troubleshooting steps: symptom, analysis, hypothesis, test.
- RCA tools: 5 Whys, fishbone diagram.
- Common failures: wear, breakage, misalignment.
- Failure mode and effects analysis (FMEA) basics.
- Documentation of failures and solutions.
- Case studies: troubleshooting a progressive die.

Day 11: Repair Techniques: Welding, Machining, and Refurbishment

- Welding repair procedures for tool steels.
- Preheating and post-weld heat treatment.
- Machining: turning, milling, grinding.
- Surface restoration: hardfacing, metal spray.
- Lapping and honing for precision fits.
- Quality checks on repaired components.

Day 12: Tooling Alignment and Calibration

- Alignment of dies, punches, and guides.
- Using dial indicators for runout.
- Laser alignment systems.
- Calibration of gauges and instruments.
- Tolerance stack-up analysis.
- Practical: align a press brake tool.

Day 13: Mould Maintenance and Repair

- Mould types: two-plate, three-plate, hot runner.
- Mould components: cavities, cores, ejectors.
- Common defects: flash, short shots, weld lines.
- Mould polishing and surface finishing.
- Hot runner system maintenance.
- Practical: disassemble and reassemble a mould.

Day 14: Die Maintenance and Repair

- Die types: blanking, piercing, forming, progressive.
- Die components: punches, dies, strippers, pilots.
- Sharpening and grinding of cutting edges.
- Adjustment of shut height and pressure pads.
- Die tryout and troubleshooting.
- Practical: sharpen a blanking die punch.

Day 15: Jig and Fixture Maintenance

- Types of jigs: drilling, milling, assembly.
- Fixture components: clamps, locators, supports.
- Bushings and drill guides.
- Wear detection and replacement.
- Modular fixturing systems.
- Practical: repair a worn drill jig bushing.

Day 16: Advanced Diagnostics and Condition Monitoring

- Vibration sensors and analysis.
- Thermographic cameras for hot spots.
- Oil analysis: particle count, spectroscopy.
- Acoustic emission monitoring.
- Data trending and predictive maintenance.
- Practical: perform vibration measurement on a press.

Day 17: Integration, Quality Assurance, and Final Assessment

- Case study: complete maintenance of a production tool.
- Quality control: inspection reports, sign-offs.
- Continuous improvement in maintenance.
- Review of key concepts.
- Written and practical assessment.
- Course evaluation 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 **20 NQF credits** at **NQF Level 3**.

## PRICING (PER DELEGATE, EX-VAT)

| Delegates | Training Method | Price per Delegate | Total |
|---|---|---|---|
| 1 | Online | R 39,500.00 | **R 39,500.00** |
| 1 | In-House | R 53,300.00 | **R 53,300.00** |
| 1 | On-Campus (Pretoria) | R 59,200.00 | **R 59,200.00** |

## UPCOMING SESSIONS

| Start | End | Method | Venue |
|---|---|---|---|
| 02 Dec 2026 | 24 Dec 2026 | On-Campus | Dar es Salaam, Tanzania |
| 03 Dec 2026 | 25 Dec 2026 | On-Campus | Shenzhen, China |
| 04 Dec 2026 | 28 Dec 2026 | On-Campus | Mauritius |
| 07 Dec 2026 | 29 Dec 2026 | On-Campus | Abu Dhabi, UAE |
| 08 Dec 2026 | 30 Dec 2026 | Online | — |
| 09 Dec 2026 | 31 Dec 2026 | On-Campus | Johannesburg, South Africa |
| 10 Dec 2026 | 01 Jan 2027 | On-Campus | Victoria Falls, Zimbabwe |
| 11 Dec 2026 | 04 Jan 2027 | On-Campus | Kinshasa, DRC |

Contact us if no suitable date is listed — on-demand sessions can be arranged for groups.

## HOW TO GET A QUOTATION OR APPLY

1. **Get an instant quotation online:** visit www.aaticd.co.za, open the page for this course (Unit Standard 13257) and click **Get A Quotation**. 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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