



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

Making Operations in Engineering Manufacturing

Manufacturing, Engineering and Technology / Manufacturing and Assembly

Unit Standard 243682 · NQF Level 2 · 36 Credits · 33 Days

COURSE OVERVIEW

This course equips learners with the practical skills and theoretical knowledge required to perform making operations in an engineering manufacturing environment. It covers safe work practices, material handling, and the operation of basic manufacturing equipment. Successful learners will be able to produce components according to specifications while adhering to health and safety regulations.

Category	Manufacturing, Engineering and Technology
Subfield	Manufacturing and Assembly
Unit Standard	243682
Accreditation	SAQA Accredited · NQF Level 2 · 36 Credits
Duration	33 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Demonstrate safe working practices and identify hazards related to making operations.
- Interpret engineering drawings and specifications to plan the making process.
- Select and use appropriate tools, equipment, and materials for making operations.
- Perform making operations such as cutting, drilling, and assembling to achieve required tolerances.
- Inspect completed work for quality and conformance to specifications.
- Complete workplace documentation and report any deviations or non-conformances.

WHO SHOULD ATTEND

- This course is designed for engineering manufacturing operators, artisans, and technicians who are involved in making operations such as cutting, shaping, assembling, or finishing components.
- It is also suitable for apprentices and trainees entering the manufacturing sector.

COURSE OUTLINE

Day 1: Introduction to Operations in Engineering Manufacturing

- Overview of engineering manufacturing sectors
- Definition of operations management
- The manufacturing process: inputs, processes, outputs
- Introduction to quality management principles
- Health and safety fundamentals in manufacturing
- Roles and responsibilities of operations personnel

Day 2: Manufacturing Processes and Techniques

- Casting and molding processes
- Metal forming: rolling, forging, extrusion
- Machining: turning, milling, drilling
- Joining: welding, brazing, adhesive bonding
- Material properties and selection
- Process capability and limitations

Day 3: Production Planning and Scheduling

- Production planning objectives
- Master production schedule (MPS)
- Material requirements planning (MRP)
- Capacity requirements planning (CRP)
- Scheduling methods: forward, backward, finite
- Gantt charts and critical path method

Day 4: Inventory Management in Manufacturing

- Raw materials, work-in-progress, finished goods
- Inventory carrying costs
- ABC analysis
- EOQ model and reorder points
- Safety stock and lead time management
- JIT and lean inventory concepts

Day 5: Quality Control and Assurance

- Quality management systems (ISO 9001)
- Control charts for variables and attributes
- Process capability indices (Cp, Cpk)
- Acceptance sampling (AQL)
- Root cause analysis
- Kaizen and Six Sigma overview

Day 6: Maintenance Strategies in Manufacturing

- Reactive, preventive, predictive, proactive maintenance
- Reliability-centered maintenance (RCM)
- TPM pillars and autonomous maintenance
- Overall equipment effectiveness (OEE)
- Maintenance planning and scheduling

- Spare parts management

Day 7: Health, Safety, and Environment (HSE)

- Occupational Health and Safety Act (OHSA)
- Hazard identification and risk assessment (HIRA)
- Personal protective equipment (PPE)
- Incident reporting and investigation
- Environmental management systems (ISO 14001)
- Waste minimization and recycling

Day 8: Lean Manufacturing Principles

- Lean philosophy and history
- Value-added vs. non-value-added activities
- Seven wastes: overproduction, waiting, transport, etc.
- Value stream mapping symbols and steps
- 5S: Sort, Set in order, Shine, Standardize, Sustain
- Kanban systems

Day 9: Supply Chain Management in Manufacturing

- Supply chain structure and flows
- Supplier relationship management (SRM)
- Make-or-buy decisions
- Logistics: transportation, warehousing
- Inventory positioning and postponement
- Risk management in supply chains

Day 10: Process Improvement and Problem Solving

- PDCA cycle
- DMAIC (Define, Measure, Analyze, Improve, Control)
- Fishbone diagram and 5 Whys
- Process mapping: SIPOC, swimlane
- Failure mode and effects analysis (FMEA)
- Standard operating procedures (SOPs)

Day 11: Automation and Technology in Manufacturing

- Fixed, programmable, and flexible automation
- Robotics in manufacturing
- Programmable logic controllers (PLCs)
- SCADA systems
- Internet of Things (IoT) in manufacturing
- Digital twins and smart factories

Day 12: Cost Management and Financial Metrics

- Cost classification: direct/indirect, fixed/variable
- Break-even analysis
- Cost-volume-profit (CVP) analysis
- Budgeting process: operational and capital
- Standard costing and variance analysis
- Target costing and value engineering

Day 13: Human Factors and Team Management

- Human factors: ergonomics, fatigue, shift work
- Motivation: Maslow, Herzberg, expectancy theory
- Team dynamics and leadership styles
- Communication barriers and strategies
- Conflict resolution techniques
- Skills matrix and training plans

Day 14: Data Analysis and Decision Making

- Data collection methods: check sheets, sensors
- Descriptive statistics: mean, median, mode, range
- Graphical analysis: histograms, Pareto charts
- KPIs: throughput, yield, downtime, OEE
- Dashboards and visual management
- Decision-making models: rational, bounded rationality

Day 15: Regulatory Compliance and Standards

- ISO 9001, ISO 14001, ISO 45001 overview
- SANS standards for engineering
- Legal compliance: labour, environment, safety
- Internal and external audits
- Document control and traceability
- Non-conformance and corrective action

Day 16: Project Management for Operations

- Project life cycle: initiation, planning, execution, closure
- Work breakdown structure (WBS)
- Network diagrams: PERT, CPM
- Resource levelling and smoothing
- Risk identification and mitigation
- Project monitoring: earned value management

Day 17: Sustainability and Green Manufacturing

- Triple bottom line: people, planet, profit
- Energy management systems (ISO 50001)
- Water and waste reduction strategies
- Life cycle assessment (LCA) methodology
- Eco-design and remanufacturing
- Carbon footprint and reporting

Day 18: Advanced Manufacturing Technologies

- Additive manufacturing: processes and materials
- Composite materials: types and applications
- AI and machine learning in quality and maintenance
- Nanotechnology in coatings and sensors
- Cyber-physical systems
- Future trends in manufacturing

Day 19: Integrated Operations Management

- Operations strategy alignment with business goals
- Balanced scorecard: financial, customer, process, learning
- Lean Six Sigma project selection
- Simulation of a manufacturing improvement project
- Change management principles
- Developing a continuous improvement culture

Day 20: Final Review and Assessment

- Review of core topics: processes, quality, maintenance, lean
- Case study analysis
- Written assessment (multiple choice and short answer)
- Practical demonstration of skills (if applicable)
- Feedback and course evaluation
- Certificate of completion preparation

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 **36 NQF credits** at **NQF Level 2**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 94,700.00	R 94,700.00
1	In-House	R 123,100.00	R 123,100.00
1	On-Campus (Pretoria)	R 142,000.00	R 142,000.00

UPCOMING SESSIONS

Start	End	Method	Venue
05 Aug 2026	18 Sep 2026	On-Campus	Mauritius
06 Aug 2026	21 Sep 2026	On-Campus	Cape Town, South Africa
07 Aug 2026	22 Sep 2026	On-Campus	Dubai, UAE
10 Aug 2026	23 Sep 2026	On-Campus	Abu Dhabi, UAE
11 Aug 2026	24 Sep 2026	On-Campus	Durban, South Africa
11 Aug 2026	24 Sep 2026	On-Campus	Mauritius
12 Aug 2026	25 Sep 2026	On-Campus	Cape Town, South Africa
13 Aug 2026	28 Sep 2026	On-Campus	Dubai, UAE

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 243682) 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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