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@aaticd.co.za · Website: www.aaticd.co.za

COURSE BROCHURE

Metals Production Process Planning and Setup

Manufacturing, Engineering and Technology / Manufacturing and Assembly

Unit Standard 259685 · NQF Level 4 · 13 Credits · 10 Days

COURSE OVERVIEW

This course equips learners with the knowledge and skills to plan and set up a metals production process in a manufacturing environment. Participants will learn to interpret production specifications, select appropriate equipment, and establish workflows to ensure efficient and safe operations. The course aligns with the SAQA unit standard for planning and setting up metals production processes.

Category	Manufacturing, Engineering and Technology
Subfield	Manufacturing and Assembly
Unit Standard	259685
Accreditation	SAQA Accredited · NQF Level 4 · 13 Credits
Duration	10 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS — verifiable online

LEARNING OUTCOMES

- Interpret production specifications and work instructions to determine process requirements for metals production.
- Select and prepare appropriate equipment, tools, and materials for the metals production process.
- Plan the sequence of operations and layout of the production area to optimize workflow and safety.
- Set up production equipment and conduct pre-production checks to ensure readiness.
- Implement quality control measures and monitor process parameters during setup.
- Document the setup process and communicate instructions to the production team.

WHO SHOULD ATTEND

- This course is designed for production supervisors, team leaders, and technicians involved in metals manufacturing who are responsible for planning and setting up production processes.
- It is also suitable for aspiring production managers seeking to enhance their technical and planning competencies.

COURSE OUTLINE

Day 1: Introduction to Metals Production and Process Planning

- Overview of metals production: from ore to finished product
- Types of metals and alloys commonly produced
- Introduction to process planning principles
- Key terminology: throughput, yield, cycle time
- Safety, health, and environmental considerations
- Quality management systems (ISO 9001, ISO/TS 16949
- Documentation and record-keeping basics
- Case study: typical production flow

Day 2: Raw Materials and Feedstock Preparation

- Raw material types: ores, scrap, alloys, fluxes
- Sampling and analysis methods
- Crushing, grinding, and screening
- Blending and homogenization
- Material handling systems
- Storage and inventory management
- Yield calculations and loss minimization
- Quality checks: chemical composition, moisture

Day 3: Melting and Refining Processes

- Electric arc furnaces, induction furnaces, converters
- Charge calculations and scrap optimization
- Melting stages: charging, melting, refining, tapping
- Slag formation and control
- Deoxidation and alloying
- Temperature control and sampling
- Refining processes: decarburization, desulfurization
- Energy management and efficiency

Day 4: Casting and Solidification

- Continuous casting vs. ingot casting
- Mould design and tundish operation
- Casting speed, cooling rate, and strand support
- Solidification defects: segregation, porosity, cracks
- Electromagnetic stirring and soft reduction
- Cutting and handling of cast products
- Inspection: surface, ultrasonic, dimensional
- Casting simulation software basics

Day 5: Hot and Cold Forming Processes

- Hot rolling: roughing, finishing, coiling
- Forging: open-die, closed-die
- Extrusion: direct, indirect
- Temperature control: reheating furnaces, soaking
- Roll pass design basics

- Lubrication and cooling systems
- Defects: scale, laps, cracks, waviness
- Cold forming: drawing, rolling, and annealing

Day 6: **Heat Treatment and Surface Finishing**

- Annealing, normalizing, quenching, tempering
- Heat treatment furnaces and atmospheres
- Quench media selection
- Surface finishing: pickling, galvanizing, coating
- Mechanical properties testing: hardness, tensile
- Microstructure analysis
- Distortion and cracking prevention
- Process documentation and traceability

Day 7: **Process Flow Design and Layout**

- Process flow charting symbols and conventions
- Material flow analysis and spaghetti diagrams
- Plant layout types: product, process, cellular
- Line balancing and bottleneck identification
- Inventory and buffer sizing
- Lean tools: 5S, kaizen, value stream mapping
- Simulation software for flow design
- Safety and ergonomics in layout

Day 8: **Production Scheduling and Capacity Planning**

- Production planning hierarchy: long, medium, short term
- Capacity calculations: theoretical vs. effective
- Scheduling techniques: forward, backward, finite
- Sequencing rules (EDD, SPT, etc.
- Changeover time reduction (SMED
- Gantt charts and critical path
- ERP/MES systems for scheduling
- Performance metrics: OEE, throughput

Day 9: **Quality Control and Continuous Improvement**

- SPC: control charts, capability indices
- Sampling plans and inspection methods
- Root cause analysis: fishbone, 5 whys
- Failure mode and effects analysis (FMEA
- PDCA cycle and DMAIC
- Lean Six Sigma in metals
- Non-destructive testing (NDT) overview
- Corrective and preventive actions (CAPA

Day 10: **Integration, Project Planning, and Assessment**

- Review of entire planning process
- Case study: develop a process plan from raw material to finished product
- Cost estimation and budgeting

- Risk assessment and mitigation
- Environmental and waste management
- Presentation of group projects
- Mock assessment and feedback
- Industry trends: digitalization, Industry 4.0
- Course wrap-up and evaluation

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 **13 NQF credits** at **NQF Level 4**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 35,800.00	**R 35,800.00**
1	In-House	R 46,500.00	**R 46,500.00**
1	On-Campus (Pretoria)	R 53,700.00	**R 53,700.00**

UPCOMING SESSIONS

Start	End	Method	Venue
04 Aug 2026	17 Aug 2026	On-Campus	Pretoria, South Africa
04 Aug 2026	17 Aug 2026	On-Campus	Lagos, Nigeria
05 Aug 2026	18 Aug 2026	On-Campus	Johannesburg, South Africa
06 Aug 2026	19 Aug 2026	On-Campus	Mauritius
07 Aug 2026	20 Aug 2026	On-Campus	Cape Town, South Africa
10 Aug 2026	21 Aug 2026	On-Campus	Pretoria, South Africa
11 Aug 2026	24 Aug 2026	On-Campus	Abu Dhabi, UAE
12 Aug 2026	25 Aug 2026	On-Campus	Mauritius

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 259685) 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.

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 · WhatsApp: +27 65 077 6310 · apply@aaticd.co.za · www.aaticd.co.za