



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

Underground Coal Mine Blasting Operations Control Training

Manufacturing, Engineering and Technology / Fabrication and Extraction

Unit Standard 110125 · NQF Level 3 · 15 Credits · 12 Days

COURSE OVERVIEW

This course equips learners with the competencies required to control blasting operations in underground coal mines. It covers safe handling, storage, and use of explosives, blast design, initiation systems, and compliance with the Mine Health and Safety Act. Learners will be able to plan, execute, and monitor blasting activities to ensure safety and productivity.

Category	Manufacturing, Engineering and Technology
Subfield	Fabrication and Extraction
Unit Standard	110125
Accreditation	SAQA Accredited · NQF Level 3 · 15 Credits
Duration	12 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Apply relevant legislation, codes of practice, and mine standards to underground coal mine blasting operations.
- Demonstrate safe handling, storage, and transportation of explosives and initiating systems.
- Design and implement blast plans according to geological and operational requirements.
- Evaluate blast results to optimize fragmentation and minimize environmental impact.
- Implement emergency procedures and respond to misfires and other blasting incidents.

WHO SHOULD ATTEND

- This course is designed for blasting assistants, shift supervisors, mine overseers, and safety officers working in underground coal mining operations who are responsible for or involved in blasting activities.

COURSE OUTLINE

Day 1: Introduction to Underground Coal Mine Blasting

- Overview of the Mine Health and Safety Act (MHSA) and relevant regulations.
- Roles: Blasting Assistant, Shift Supervisor, appointed person.
- Hazard identification: methane, coal dust, roof instability, misfires.
- Types of explosives: permitted explosives, ANFO, emulsions.
- Initiation systems: detonators, detonating cord, non-electric systems.
- Safety precautions: storage, transport, handling of explosives.

Day 2: Blasting Theory and Explosive Properties

- Rock breakage mechanisms: shock wave, gas expansion.
- Blast design parameters: burden, spacing, stemming, subdrilling.
- Permitted explosives: characteristics, limitations, safety features.
- Explosive properties: velocity of detonation, density, energy output.
- Confinement effects: venting, fragmentation, overpressure.
- Practical calculations for charge weight per hole.

Day 3: Blast Design for Underground Coal Mines

- Blast patterns: wedge cut, burn cut, parallel hole cut.
- Cut design: angle, depth, number of holes.
- Perimeter control: smooth blasting, pre-splitting.
- Initiation sequence: delay timing, decking.
- Geological considerations: joints, faults, water.
- Design calculations for a typical development round.

Day 4: Explosives Handling and Safety Procedures

- Safe handling: no smoking, static prevention, correct tools.
- Transport: vehicle requirements, segregation, signage.
- Magazine management: storage limits, temperature, ventilation.
- Security: access control, inventory, reporting theft.
- Pre-blast inspection: face condition, drilling accuracy.
- Misfire procedures: identification, marking, disposal.
- Emergency response: fire, explosion, first aid.

Day 5: Charging and Stemming Techniques

- Hole preparation: cleaning, depth check, water removal.
- Charging: manual vs. pneumatic, cartridge loading.
- Primer placement: bottom vs. top initiation.
- Stemming: material selection, length, tamping.
- Initiation system hookup: trunkline, connectors.
- Circuit testing: continuity, resistance, stray current checks.
- Records: charge log, shotfirer's report.

Day 6: Blasting Operations and Supervision

- Pre-blast meeting: briefing, task allocation.
- Exclusion zones: barricades, signs, guard posts.
- Firing procedure: clearance, countdown, initiation.

- Post-blast inspection: fume clearance, face condition.
- Ventilation: re-entry time, gas monitoring.
- Documentation: blast report, misfire log, inventory.
- Incident reporting: any unplanned events.

Day 7: Ventilation and Gas Management After Blasting

- Blasting fumes: CO, NO_x, SO₂, their effects.
- Ventilation systems: auxiliary fans, ducting, brattice.
- Gas detection: portable monitors, fixed sensors.
- Re-entry criteria: gas limits, time delays.
- Methane management: risk of ignition.
- Emergency actions: evacuation, enhanced ventilation.

Day 8: Blasting in Special Conditions

- Water-resistant explosives and initiation.
- Controlled blasting: near seals, stoppings, cables.
- Methane drainage and monitoring before blasting.
- Misfire prevention: quality control, procedures.
- Misfire disposal: secondary blasting, chemical destruction.
- Case studies: incidents and lessons learned.

Day 9: Blasting Assessment and Quality Control

- Fragmentation analysis: visual, sieving, image analysis.
- Overbreak and underbreak assessment.
- Vibration monitoring: peak particle velocity.
- Blast efficiency: advance per round, powder factor.
- Data recording: blast logs, performance indicators.
- Improvement cycle: design, execute, measure, adjust.

Day 10: Legal Compliance and Documentation

- MSHA requirements: permits, appointment letters.
- Blasting log: details per blast.
- Magazine records: receipts, issues, returns.
- Incident reporting: forms, timelines.
- Audits: internal, DMR, external.
- Penalties: fines, suspension, criminal liability.

Day 11: Emergency Preparedness and Response

- Risk assessment: blasting hazard identification.
- Emergency plan: roles, communication, evacuation.
- Rescue equipment: stretchers, breathing apparatus.
- Firefighting: extinguishers, water, inert gas.
- First aid: burns, blast trauma, hearing loss.
- Drill scenarios: misfire, fire, explosion.
- Debrief and improvement.

Day 12: Integrated Practical Assessment and Review

- Simulated blast: design, charging, firing, inspection.
- Practical assessment: charging, hookup, safety checks.

- Written test: theory, regulations, calculations.
- Review of key concepts: Q&A; session.
- Feedback and course evaluation.
- Certification requirements: portfolio of evidence.

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 **15 NQF credits** at **NQF Level 3**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 41,000.00	R 41,000.00
1	In-House	R 53,300.00	R 53,300.00
1	On-Campus (Pretoria)	R 61,500.00	R 61,500.00

UPCOMING SESSIONS

Start	End	Method	Venue
03 Aug 2026	18 Aug 2026	On-Campus	Dubai, UAE
04 Aug 2026	19 Aug 2026	On-Campus	Pretoria, South Africa
04 Aug 2026	19 Aug 2026	On-Campus	Lagos, Nigeria
05 Aug 2026	20 Aug 2026	On-Campus	Johannesburg, South Africa
06 Aug 2026	21 Aug 2026	On-Campus	Mauritius
07 Aug 2026	24 Aug 2026	On-Campus	Cape Town, South Africa
10 Aug 2026	25 Aug 2026	On-Campus	Pretoria, South Africa
11 Aug 2026	26 Aug 2026	On-Campus	Abu Dhabi, 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 110125) 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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