



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

Large Diamond Gemstone Design And Marking For Parting Training

Manufacturing, Engineering and Technology / Fabrication and Extraction

Unit Standard 110221 · NQF Level 5 · 36 Credits · 33 Days

COURSE OVERVIEW

This course equips learners with the specialised skills required to design and mark large diamond gemstones for parting. Participants will master the techniques of analysing crystal structures, plotting inclusion patterns, and applying marking strategies to optimise yield and value. The programme ensures competence in precision marking for safe and efficient diamond parting.

Category	Manufacturing, Engineering and Technology
Subfield	Fabrication and Extraction
Unit Standard	110221
Accreditation	SAQA Accredited · NQF Level 5 · 36 Credits
Duration	33 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Analyse the crystal structure and internal characteristics of large diamond gemstones to determine optimal parting planes.
- Design marking plans that maximise weight retention and value while minimising risk of breakage.
- Apply industry-standard tools and techniques to accurately mark parting lines on large diamonds.
- Evaluate the impact of inclusions, cleavages, and grain direction on marking decisions.
- Demonstrate compliance with safety protocols and quality assurance standards during the marking process.

WHO SHOULD ATTEND

- This course is intended for diamond cutters, polishers, and jewellery designers who wish to advance their expertise in large diamond gemstone design and marking.
- It is also suitable for quality controllers and graders seeking to understand the technical aspects of parting preparation.

COURSE OUTLINE

Day 1: Introduction to Large Diamond Gemstone Design and Parting

- Overview of the diamond value chain: from rough to polished
- Definition of large diamonds (typically >1 carat) and their significance
- Introduction to gemstone design principles: symmetry, proportion, and optical performance
- Explanation of parting: the process of splitting rough diamonds along cleavage planes
- Safety and ethical considerations in diamond handling
- Overview of tools and equipment used in design and parting

Day 2: Diamond Properties and Crystal Structure

- Diamond crystal system: cubic, octahedral, dodecahedral forms
- Cleavage planes: {111} and their role in parting
- Optical properties: brilliance, fire, and scintillation
- Hardness variations and grain direction
- Inclusions and their impact on design and parting
- Practical exercise: Identifying crystal forms using models

Day 3: Rough Diamond Evaluation and Planning

- Rough diamond grading: carat weight, color, clarity, and shape
- Inclusion mapping: types, positions, and impact on value
- Yield optimization: balancing weight retention against cut quality
- Planning for polished shapes: round brilliant, princess, emerald, etc.
- Cost-benefit analysis of different design options
- Practical exercise: Evaluating rough diamonds and creating a preliminary plan

Day 4: Design Principles for Large Diamonds

- Proportions and angles: crown angle, pavilion angle, table size, girdle thickness
- Light behavior: total internal reflection, leakage, and extinction
- Design rules for large diamonds: modified brilliant cuts, step cuts, mixed cuts
- Computer-aided design (CAD) software introduction
- Design modifications for included or irregular rough
- Practical exercise: Designing a round brilliant for a large rough

Day 5: Advanced Design Techniques: Fancy Shapes

- Fancy shape categories: modified brilliants, step cuts, and mixed cuts
- Design parameters for pear, oval, marquise, heart, and cushion shapes
- Optical performance in fancy shapes: bow-tie effect and mitigation
- Inclusion placement strategies for fancy shapes
- Market trends and value factors for fancy shapes
- Practical exercise: Designing a fancy shape for a given rough

Day 6: Parting Theory and Principles

- Cleavage mechanics: stress concentration, crystal orientation
- Factors affecting parting: inclusion presence, crystal perfection, internal stresses
- Parting tools: blades, hammers, and specialized jigs
- Parting technique: notching, striking, and controlling propagation
- Comparison with sawing: laser, diamond saw, and wire saw

- Safety protocols for parting operations

Day 7: Parting Practical Preparation and Setup

- Notching: location, depth, and angle relative to cleavage plane
- Orientation verification using crystal form and optical methods
- Workstation setup: lighting, magnification, and tool arrangement
- Practice notching on synthetic diamonds
- Troubleshooting common notching errors
- Practical exercise: Notching a synthetic diamond for parting

Day 8: Parting Execution and Control

- Striking technique: force, angle, and follow-through
- Monitoring cleavage propagation: visual and auditory cues
- Dealing with deviations: stopping and redirecting the split
- Post-parting inspection: surface quality, step formation, and yield
- Documentation and recording of parting outcomes
- Practical exercise: Parting practice diamonds under supervision

Day 9: Parting of Large Diamonds: Advanced Considerations

- Challenges of large diamond parting: weight, internal stresses, inclusion complexity
- Advanced notching: multiple notches, controlled stress direction
- Use of laser-assisted parting for precision
- Stress modeling and simulation software
- Case studies of large diamond parting successes and failures
- Practical exercise: Planning a parting strategy for a large rough

Day 10: Post-Parting Design Adjustment

- Inspection of parted surfaces: flatness, step height, and inclusion exposure
- Design modification strategies: reorienting, resizing, or changing shape
- Yield analysis: comparing pre- and post-parting carat weight
- Cost-benefit analysis of parting vs. alternative approaches
- Practical exercise: Modifying a design after parting

Day 11: Marking for Parting: Theory and Techniques

- Marking materials: ink, scribe, laser etching, and adhesive markers
- Marking techniques: dotting, line drawing, and color coding
- Relationship between marking and parting outcome
- Marking for multiple pieces from a single rough
- Practical considerations: visibility, removal, and durability
- Practical exercise: Marking a rough diamond for planned parting

Day 12: Integration of Design and Parting Planning

- Step-by-step workflow: rough evaluation design parting plan marking
- Software integration: CAD for design, simulation for parting
- Decision trees for complex rough diamonds
- Peer review and feedback on plans
- Documentation and presentation skills
- Practical exercise: Creating a complete plan for a given rough

Day 13: Quality Control and Grading of Parted Diamonds

- Cut quality parameters: proportions, symmetry, polish
- Clarity grading of parted surfaces: new inclusions, fractures
- Common parting defects: step marks, rough surfaces, misorientation
- Grading tools: loupe, microscope, proportion scope
- Value assessment: comparing parted vs. non-parted diamonds
- Practical exercise: Grading a set of parted diamonds

Day 14: Advanced Topics: Laser Parting and New Technologies

- Laser parting: principles, equipment, and safety
- Advantages: precision, minimal material loss, complex cuts
- Limitations: cost, heat effects, and diamond type suitability
- Emerging technologies: waterjet cutting, ultrasonic parting
- Industry trends: automation, AI in design, and sustainability
- Practical exercise: Observing a laser parting demonstration (if available)

Day 15: Case Studies in Large Diamond Design and Parting

- Famous large diamonds: Cullinan, Koh-i-Noor, Hope, etc.
- Case study 1: Successful parting of a large rough
- Case study 2: Design innovation for maximum brilliance
- Case study 3: Parting failure and lessons learned
- Ethical considerations: conflict diamonds, provenance
- Group discussion and analysis

Day 16: Practical Workshop: Design and Marking for Parting

- Workshop setup: individual workstations with tools and materials
- Task: Design and mark a large rough diamond (synthetic) for parting
- Steps: rough evaluation design marking documentation
- Instructor guidance and troubleshooting
- Peer collaboration and feedback
- Practical exercise: Complete design and marking on provided rough

Day 17: Practical Workshop: Parting Execution

- Workshop setup: parting stations with safety equipment
- Task: Part a previously designed and marked synthetic diamond
- Steps: preparation notching striking inspection
- Instructor supervision and corrective feedback
- Documentation of results
- Practical exercise: Parting a synthetic diamond

Day 18: Practical Workshop: Post-Parting Design Adjustment and Grading

- Workshop: Inspect parted pieces and modify original design
- Grading: use tools to assess cut, clarity, and symmetry
- Report writing: documenting decisions, results, and lessons
- Peer review of reports
- Individual feedback from instructors
- Practical exercise: Finalize design and grade parted diamonds

Day 19: Business and Ethical Considerations

- Business models: independent contractor, employee, entrepreneur

- Costing: materials, labor, equipment, overhead
- Pricing strategies: value-based, market-based
- Ethical sourcing: Kimberley Process, conflict-free certification
- Building a professional portfolio: documenting work
- Marketing services to clients and employers

Day 20: Final Assessment and Course Review

- Written exam: theory covering all course topics
- Practical exam: design, mark, and part a synthetic diamond
- Oral presentation: explain decisions and outcomes
- Course review: Q&A; session
- Feedback on performance and areas for improvement
- Certification process and next steps

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 5**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 99,400.00	R 99,400.00
1	In-House	R 129,300.00	R 129,300.00
1	On-Campus (Pretoria)	R 149,100.00	R 149,100.00

UPCOMING SESSIONS

Start	End	Method	Venue
04 Aug 2026	17 Sep 2026	On-Campus	Mauritius
05 Aug 2026	18 Sep 2026	On-Campus	Cape Town, South Africa
06 Aug 2026	21 Sep 2026	On-Campus	Dubai, UAE
07 Aug 2026	22 Sep 2026	On-Campus	Pretoria, South Africa
07 Aug 2026	22 Sep 2026	On-Campus	Lagos, Nigeria
10 Aug 2026	23 Sep 2026	On-Campus	Durban, South Africa
10 Aug 2026	23 Sep 2026	On-Campus	Mauritius
11 Aug 2026	24 Sep 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 110221) 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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