| **Model Curriculum**  **QP Name:**  **Gemstone Processor**  **Electives: Gemstone Pre-shaping / Gemstone Polishing / Gemstone Facet Making / Gemstone Girdle Polishing**  **QP Code: G&J/Q6707**  **QP Version: 2.0**  **NSQF Level: 3**  **Model Curriculum Version: 3.0** |
| --- |
| Gems & Jewellery Skill Council of India  Business Facilitation Centre, 3rd Floor, Seepz Special Economic Zone,  Andheri (E). Mumbai 400 096. |



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Training Parameters

| **Sector** | Gem & Jewellery |
| --- | --- |
| **Sub-Sector** | Gemstone Processing |
| **Occupation** | Shaping, Faceting and Polishing |
| **Country** | India |
| **NSQF Level** | 3 |
| **Aligned to NCO/ISCO/ISIC Code** | NCO-2015/ 7313.1404 |
| **Minimum Educational Qualiﬁcation and Experience** | 9th Grade pass (No Experience required)  OR  8th Grade pass (1 year relevant experience)  OR  Previous relevant Qualification of NSQF Level 3 (1 year relevant experience) |
| **Pre-Requisite License or Training** | NA |
| **Minimum Job Entry Age** | 18 Years |
| **Last Reviewed On** |  |
| **Next Review Date** |  |
| **NSQC Approval Date** |  |
| **QP Version** | 3.0 |
| **Model Curriculum Creation Date** |  |
| **Model Curriculum Valid Up to Date** |  |
| **Model Curriculum Version** *<* | 3.0 |
| **Minimum Duration of the Course** | 330 Hours |
| **Maximum Duration of the Course** | 330 Hours |

# Program Overview

This section summarizes the end objectives of the program along with its duration.

## Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills.

* Examine the strategy for aligning and doping the stones.
* Use your interpersonal skills when speaking with coworkers.
* Observe the organization's health and safety regulations.
* Show how to pre-shape the gemstone according to the blueprint.
* Use the proper technique when using a tumbler.
* Oversee the appropriate facets' polishing in accordance with the size, shape, and type of the stones.
* Show how to cut facets based on the stones' measured edges, colour, brilliance, and shape.
* Show how to use the proper angle to polish the girdles of faceted gemstones.
* Observe the workplace's health and safety regulations.

## Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

| NOS and Module Details | Theory  Duration | Practical  Duration | On-the-Job Training Duration (Mandatory) | On-the-Job Training Duration (Recommended) | Total Duration |
| --- | --- | --- | --- | --- | --- |
| G&J/N6601 – Dop the gemstone  NOS Version No. 2.0  NSQF Level 4 | **30:00** | **30:00** | **60:00** | **-** | **30:00** |
| Module 1: Introduction and orientation of the Gems and Jewellery sector | 5:00 | 0:00 | **-** | - | 5:00 |
| Module 2: Doping the Gemstone | 10:00 | 20:00 | 60:00 | - | 30:00 |
| G&J/N9902 – Maintain health and safety at workplace  NOS Version No. 3.0  NSQF Level 5 | **8:00** | **22:00** | - | - | **30:00** |
| Module 3: Health and safety at workplace | 8:00 | 22:00 | - | - | 30:00 |
| G&J/Nxxxx: Implement Circular Economy and Sustainable Practices in Gem and Jewellery Industry  NOS Version No. V1.0  NSQF Level 2 | **10:00** | **20:00** | - | - | **30:00** |
| Module 4: Implement Circular Economy and Sustainable Practices in Gem and Jewellery Industry | 10:00 | 20:00 | - | - | 30:00 |
| DGT/VSQ/N0101 - Employability Skills (30 hours)  NOS Version No. – 1.0  NSQF Level – 2 | **12:00** | **18:00** | - | - | **30:00** |
| Module 5: Introduction to Employability Skills | 0.5:00 | 0.5:00 | - | - | 1:00 |
| Module 6: Constitutional values - Citizenship | 0.5:00 | 0.5:00 | - | - | 1:00 |
| Module 7: Becoming a Professional in the 21st Century | 0.5:00 | 0.5:00 | - | - | 1:00 |
| Module 8: Basic English Skills | 1:00 | 1:00 | - | - | 2:00 |
| Module 9: Communication Skills | 1.5:00 | 2.5:00 | - | - | 4:00 |
| Module 10: Diversity & Inclusion | 0.5:00 | 0.5:00 | - | - | 1:00 |
| Module 11: Financial and Legal Literacy | 1.5:00 | 2.5:00 | - | - | 4:00 |
| Module 12: Essential Digital Skills | 1:00 | 2:00 | - | - | 3:00 |
| Module 13: Entrepreneurship | 2.5:00 | 4.5:00 | - | - | 7:00 |
| Module 14: Customer Service | 1.5:00 | 2.5:00 | - | - | 4:00 |
| Module 15: Getting ready for apprenticeship & Jobs | 1:00 | 1:00 | - | - | 2:00 |
| Total Duration | **60:00** | **90:00** | **60:00** | **-** | **210:00** |

## Elective Modules

The table lists the modules and their duration corresponding to the Elective NOS of the QP.

**Elective 1: Gemstone Pre-shaping**

| NOS and Module Details | Theory Duration | Practical Duration | On-the-Job Training Duration (Mandatory) | On-the-Job Training Duration (Recommended) | Total Duration |
| --- | --- | --- | --- | --- | --- |
| G&J/N6602 – Pre-shape or pre-form gemstone  NOS Version No. 3.0  NSQF Level 3 | **15:00** | **15:00** | **30:00** | - | **60:00** |
| Module 15: Pre-shaping/ Pre-forming Gemstone | 15:00 | 15:00 | 30:00 | **-** | 30:00 |
| G&J/N6603 – Operating Tumble Machine and Delivering Stones  NOS Version No. 3.0  NSQF Level 3 | **15:00** | **15:00** | **30:00** | - | **60:00** |
| Module 16: Operating Tumble Machine and Delivering Stones | 15:00 | 15:00 | 30:00 | **-** | 60:00 |
| Total Duration | **30:00** | **30:00** | **60:00** | - | **120:00** |

**Elective 2: Gemstone Polishing**

| NOS and Module Details | Theory Duration | Practical Duration | On-the-Job Training Duration (Mandatory) | On-the-Job Training Duration (Recommended) | Total Duration |
| --- | --- | --- | --- | --- | --- |
| G&J/N6701 - Polish the faceted or cabochon gemstone  NOS Version No. 3.0  NSQF Level 3 | **30:00** | **30:00** | **60:00** | - | **120:00** |
| Module 17: Polish the Faceted or Cabochon Gemstone | 30:00 | 30:00 | 60:00 | - | 120:00 |
| Total Duration | **30:00** | **30:00** | **60:00** | - | **120:00** |

**Elective 3: Gemstone Polishing**

| NOS and Module Details | Theory Duration | Practical Duration | On-the-Job Training Duration (Mandatory) | On-the-Job Training Duration (Recommended) | Total Duration |
| --- | --- | --- | --- | --- | --- |
| G&J/N6702 - Make facets on gemstones  NOS Version No. 3.0  NSQF Level 3 | **30:00** | **30:00** | **60:00** | - | **120:00** |
| Module 18: Making Facets on Gemstones | 30:00 | 30:00 | 60:00 | - | 120:00 |
| Total Duration | **30:00** | **30:00** | **60:00** | - | **120:00** |

**Elective 4: Gemstone Girdle Polishing**

| NOS and Module Details | Theory Duration | Practical Duration | On-the-Job Training Duration (Mandatory) | On-the-Job Training Duration (Recommended) | Total Duration |
| --- | --- | --- | --- | --- | --- |
| G&J/N6703 - Polish the girdle of faceted gemstone  NOS Version No. 3.0  NSQF Level 3 | **30:00** | **30:00** | **60:00** | - | **120:00** |
| Module 19: Polish the Girdle of Faceted Gemstone Gemstone | 30:00 | 30:00 | 60:00 | - | 120:00 |
| Total Duration | **30:00** | **30:00** | **60:00** | - | **120:00** |

# Module Details

## Module 1: Introduction and orientation to the Gems and Jewellery sector

*Bridge Module*

**Terminal Outcomes:**

* Explain the overview of the sector.
* Discuss the roles and responsibilities of a Gemstone Processor.

| Duration: *10:00* | Duration: *0:00* |
| --- | --- |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Explain the scope of the Gems and Jewellery sector. * List job opportunities for the Gemstone Processor. * Discuss the roles and responsibilities of a Gemstone Processor. * Explain the basics of gemstone processing. |  |
| **Classroom Aids:** | |
| Laptop, white board, marker, projector | |
| **Tools, Equipment and Other Requirements** | |
|  | |

## Module 2: Dop the gemstone

*Mapped to G&J/N6601, v2.0*

**Terminal Outcomes:**

* Verify and inspect gemstones for type, weight, size, hardness, and structural integrity.
* Apply job sheet instructions for accurate alignment and securement.
* Select appropriate dops, adhesives, and heating techniques for stability and quality.
* Maintain a clean, efficient, hazard-free doping process.
* Record and report doped stone details for quality control and traceability.

| Duration:*<20:00>* | Duration:*<30:00>* |
| --- | --- |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Identify the stone type, weight, and quantity from the job sheet. * Examine the shape, size, hardness, and structural integrity of stones before doping. * Interpret the job sheet to determine the correct doping process. * Differentiate between dop types and adhesive/wax materials suitable for various stones. * Analyze the effects of heating temperature on stone quality, color, and structure. * Explain the importance of accurate alignment for optimal faceting. * Describe the process of securing stones to prevent movement during faceting. * Discuss industry standards for doping efficiency, productivity, and quality control. * Summarize safety measures to minimize wastage, damage, and hazards in doping. * Record the details of doped stones and report inconsistencies to the supervisor. | * Verify the stone type, weight, and quantity received against the job sheet. * Inspect stones for shape, size, hardness, and structural defects. * Align the stone accurately on the dop for precise faceting. * Select the appropriate dop and adhesive/wax based on stone type and size. * Control the heating temperature to avoid stone damage or color alteration. * Ensure a secure setting of the stone to prevent movement during faceting. * Execute a clean and scratch-free doping process to maintain stone quality. * Complete the doping process efficiently to meet production deadlines. * Achieve the daily target for doped stones as per industry benchmarks. * Maintain records of doped stones and report any defects to the supervisor. |
| **Classroom Aids:** | |
| Whiteboard, marker pen, computer or laptop attached to LCD projector, scanner, computer speakers | |
| **Tools, Equipment and Other Requirements** | |
|  | |

## Module 3: Maintain health and safety at workplace *Mapped to G&J/N9902, 2.0*

**Terminal Outcomes:**

* Use appropriate PPE for different job tasks to ensure safety.
* Identify and mitigate hazards using safe working practices and ergonomics.
* Operate fire extinguishers and perform fire rescue techniques effectively.
* Administer first aid for burns, bleeding, choking, and other injuries.
* Follow emergency response protocols for evacuation and fire prevention.

| Duration:*<08:00>* | Duration:*<22:00>* |
| --- | --- |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Identify the appropriate protective clothing/equipment for different job tasks. * Explain the hazards associated with specific job activities and their potential risks. * Describe safe working practices to mitigate workplace hazards. * Recognize incorrect working postures and their impact on occupational health. * Demonstrate understanding of ergonomics and proper working postures to reduce strain-related issues. * Differentiate between various types of fire and the corresponding fire extinguishers. * Explain the use and operation of different fire extinguishers. * List rescue techniques applicable in fire emergencies. * Describe housekeeping practices that help prevent fire hazards. * State the procedures for responding to different types of workplace emergencies. * Identify different first aid procedures for injuries such as burns, bleeding, choking, and electric shock. * Outline the steps involved in emergency evacuation and assembly point protocols. | * Select and wear appropriate personal protective equipment (PPE) for given tasks. * Inspect workplace areas for potential hazards and document risks. * Apply safe working techniques to manage hazards effectively. * Demonstrate correct ergonomic postures while performing job tasks. * Operate different types of fire extinguishers based on fire classifications. * Perform rescue techniques for fire hazards, including handling smoke-filled areas and using fire blankets. * Implement fire prevention practices through proper housekeeping. * Use the correct technique to administer first aid for burns, bleeding, and choking incidents. * Respond to simulated workplace emergencies, including raising alarms and safe evacuation. * Follow the correct protocol for emergency assembly and reporting. |
| **Classroom Aids:** | |
| Whiteboard, Marker pen, Computer or Laptop attached to LCD projector, Scanner, Computer speakers | |
| **Tools, Equipment and Other Requirements :** | |
| Safety hand gloves, glasses, safety shoes, mask, fire extinguisher, first aid kit | |

## Module 4: Implement Circular Economy and Sustainable Practices in Gem and Jewellery Industry *Mapped to G&J/Nxxxx, v1.0*

**Terminal Outcomes:**

* Explain the principles of the circular economy and their relevance to sustainable practices in the gem and jewellery industry.
* Implement design techniques that enhance jewellery recyclability and reusability while minimizing material waste.
* Analyse the environmental and economic impact of material wastage, hazardous waste, and energy consumption in jewellery manufacturing.
* Optimize jewellery production processes by incorporating responsible sourcing, energy-efficient equipment, and waste management techniques.

| Duration: *10:00* | Duration: *20:00* |
| --- | --- |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Explain the principles of the circular economy and its relevance to the gem and jewellery industry. * Describe the methods for designing jewellery that support recyclability and reusability. * Identify the best practices for responsible sourcing of gemstones and metals in jewellery production. * Analyze the impact of material wastage on cost, sustainability, and environmental degradation. * Compare different waste management techniques, including recycling, upcycling, and safe disposal. * Illustrate the process of recovering and reintegrating lost gold into production. * Evaluate the role of renewable energy in jewellery manufacturing and its benefits. * Discuss industry regulations and policies related to sustainable and circular economy practices. * Summarize the significance of energy-efficient equipment and conservation techniques in jewellery production. * Assess the environmental impact of hazardous waste generated in jewellery manufacturing and methods to mitigate it. | * Demonstrate the process of identifying and selecting recyclable materials for jewellery production. * Implement modular design techniques that enable easy disassembly and reassembly of jewellery pieces. * Apply proper sorting and waste segregation practices for better recycling and disposal. * Operate energy-efficient equipment and monitor their performance to reduce power consumption. * Develop a documentation system to track and record recycled and upcycled materials. * Conduct a basic energy audit to identify inefficiencies in jewellery production processes. * Modify jewellery manufacturing processes to incorporate wax pattern reuse in the lost wax casting method. * Optimize water usage by implementing conservation measures such as recycling wastewater for non-production activities. * Design a take-back program for old and unwanted jewellery to promote sustainable practices. * Monitor and adjust indoor lighting, ventilation, and AC settings to enhance energy conservation in daily operations. |
| **Classroom Aids:** | |
| Laptop, white board, marker, projector | |
| **Tools, Equipment and Other Requirements** | |
| Recycling bins, waste segregation containers, modular design tools, digital design software, energy-efficient furnaces, renewable energy sources (solar panels, wind turbines), water recycling systems, waste tracking software, gold recovery units, wax pattern reuse equipment, take-back program infrastructure, energy audit tools, LED lighting systems, ventilation control devices, air quality monitors, sorting trays, eco-friendly packaging materials, jewellery dismantling tools, upcycling workstations, regulatory compliance documents, sustainable sourcing databases | |

## Module 5: Introduction to Employability Skills

*Mapped to DGT/VSQ/N0101*

**Terminal Outcomes:**

* Discuss about Employability Skills in meeting the job requirements

| **Duration**: *<0.5:00>* | **Duration**: *<0.5:00>* |
| --- | --- |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Discuss the importance of Employability Skills in meeting the job requirements | * Demonstrate Employability Skills |
| **Classroom Aids:** | |
| Whiteboard, marker pen, projector | |
| **Tools, Equipment and Other Requirements** | |
|  | |

## Module 6: Constitutional values - Citizenship

*Mapped to DGT/VSQ/N0101*

**Terminal Outcomes:**

* Discuss about constitutional values to be followed to become a responsible citizen

| **Duration**: *<0.5:00>* | **Duration**: *<0.5:00>* |
| --- | --- |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Explain constitutional values, civic rights, duties, citizenship, responsibility towards society etc. that are required to be followed to become a responsible citizen. | * Show how to practice different environmentally sustainable practices |
| **Classroom Aids:** | |
| Whiteboard, marker pen, projector | |
| **Tools, Equipment and Other Requirements** | |
|  | |

## Module 7: Becoming a Professional in the 21st Century

*Mapped to DGT/VSQ/N0101*

**Terminal Outcomes:**

* Demonstrate professional skills required in 21st century

| **Duration**: *<0.5:00>* | **Duration**: *<0.5:00>* |
| --- | --- |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Discuss 21st century skills. | * Display positive attitude, self -motivation, problem solving, time management skills and continuous learning mindset in different situations. |
| **Classroom Aids:** | |
| Whiteboard, marker pen, projector | |
| **Tools, Equipment and Other Requirements** | |
|  | |

## Module 8: Basic English Skills

*Mapped to DGT/VSQ/N0101*

**Terminal Outcomes:**

* Practice basic English speaking.

| **Duration**: *<1:00>* | **Duration**: *<1:00>* |
| --- | --- |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Discuss need of basic English skills. | * Use appropriate basic English sentences/phrases while speaking |
| **Classroom Aids:** | |
| Whiteboard, marker pen, projector | |
| **Tools, Equipment and Other Requirements** | |
|  | |

## Module 9: Communication Skills

*Mapped to DGT/VSQ/N0101*

**Terminal Outcomes:**

* Practice basic communication skills.

| **Duration**: *<1.5:00>* | **Duration**: *<2.5:00>* |
| --- | --- |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Discuss need of communication skills * Describe importance of team work | * Demonstrate how to communicate in a well -mannered way with others. * Demonstrate working with others in a team |
| **Classroom Aids:** | |
| Whiteboard, marker pen, projector | |
| **Tools, Equipment and Other Requirements** | |
|  | |

Module 9: Diversity & Inclusion

*Mapped to DGT/VSQ/N0101*

**Terminal Outcomes:**

* Describe PwD and gender sensitisation.

| **Duration**: *<0.5:00>* | **Duration**: *<0.5:00>* |
| --- | --- |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Discuss the significance of reporting sexual harassment issues in time | * Show how to conduct oneself appropriately with all genders and PwD |
| **Classroom Aids:** | |
| Whiteboard, marker pen, projector | |
| **Tools, Equipment and Other Requirements** | |
|  | |

## Module 10: Financial and Legal Literacy

*Mapped to DGT/VSQ/N0101*

**Terminal Outcomes:**

* Describe ways of managing expenses, income, and savings.

| **Duration**: *<1.5:00>* | **Duration**: *<2.5:00>* |
| --- | --- |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Discuss the significance of using financial products and services safely and securely. * Explain the importance of managing expenses, income, and savings. * Explain the significance of approaching the concerned authorities in time for any exploitation as per legal rights and laws | * Demonstrate ways of managing expenses, income, and savings. |
| **Classroom Aids:** | |
| Whiteboard, marker pen, projector | |
| **Tools, Equipment and Other Requirements** | |
|  | |

## Module 11: Essential Digital Skills

*Mapped to DGT/VSQ/N0101*

**Terminal Outcomes:**

* Demonstrate procedure of operating digital devices and associated applications safely.

| **Duration**: *<1:00>* | **Duration**: *<2:00>* |
| --- | --- |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Discuss the significance of using internet for browsing, accessing social media platforms, safely and securely | * Show how to operate digital devices and use the associated applications and features, safely and securely |
| **Classroom Aids:** | |
| Whiteboard, marker pen, projector | |
| **Tools, Equipment and Other Requirements** | |
|  | |

## Module 12: Entrepreneurship

*Mapped to DGT/VSQ/N0101*

**Terminal Outcomes:**

* Describe opportunities as an entrepreneur.

| **Duration**: *<2.5:00>* | **Duration**: *<4.5:00>* |
| --- | --- |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Discuss the need for identifying opportunities for potential business, sources for arranging money and potential legal and financial challenges | * Demonstrate ways for identifying opportunities for potential business, sources for arranging money and potential legal and financial challenges |
| **Classroom Aids:** | |
| Whiteboard, marker pen, projector | |
| **Tools, Equipment and Other Requirements** | |
|  | |

## Module 13: Customer Service

*Mapped to DGT/VSQ/N0101*

**Terminal Outcomes:**

* Describe ways of maintaining customer.

| **Duration**: *<1.5:00>* | **Duration**: *<2.5:00>* |
| --- | --- |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Differentiate between types of customers. * Explain the significance of identifying customer needs and addressing them. * Discuss the significance of maintaining hygiene and dressing appropriately. | * Show how to maintain hygiene and dressing appropriately. |
| **Classroom Aids:** | |
| Whiteboard, marker pen, projector | |
| **Tools, Equipment and Other Requirements** | |
|  | |

## Module 14: Getting ready for apprenticeship & Jobs

*Mapped to DGT/VSQ/N0101*

**Terminal Outcomes:**

* Describe ways of preparing for apprenticeship & Jobs appropriately.

| **Duration**: *<1:00>* | **Duration**: *<1:00>* |
| --- | --- |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Discuss the significance of dressing up neatly and maintaining hygiene for an interview * Discuss how to search and register for apprenticeship opportunities | * Create a biodata * Use various sources to search and apply for jobs |
| **Classroom Aids:** | |
| Whiteboard, marker pen, projector | |
| **Tools, Equipment and Other Requirements** | |
|  | |

## Module 15: Pre-shape or pre-form Gemstone

*Mapped to G&J/N6602, v2.0*

**Terminal Outcomes:**

* Use digital tracking systems like RFID for gemstone identification and pre-shaping.
* Operate automated grinding mills and CNC tools for precise gemstone cutting.
* Apply AI-driven monitoring to optimize gemstone calibration and quality control.
* Implement eco-friendly cooling and predictive maintenance for efficient operations.
* Utilize AR-based training to enhance skills and maintain a safe, ergonomic workspace.

| Duration:*<15:00>* | Duration:*<15:00>* |
| --- | --- |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Identify gemstone types, weight, and quantity using digital tracking or RFID systems. * Interpret AI-assisted design recommendations for pre-shaping to maximize yield. * Explain the role of automated grinding mills and vibration sensors in precision cutting. * Describe the use of CNC-based or robotic pre-shaping tools for efficiency. * Analyse real-time AI-driven monitoring for gemstone size, dimensions, and weight calibration. * Classify lap and abrasive powders based on machine-learning recommendations. * Evaluate cutting parameters to ensure high QC yield and defect minimization. * Discuss eco-friendly cooling techniques to maintain gemstone quality. * Outline automated tracking methods for measuring output in carats and stone count. * Assess AI-predicted tolerance limits for stone loss to enhance productivity. * Explain predictive maintenance and anomaly detection for issue resolution. * State the importance of maintaining a dust-free and ergonomic cutting environment. * Describe the benefits of AR-based training modules for skill enhancement. | * Verify gemstone type, weight, and quantity using RFID-based inventory systems. * Apply AI-assisted design recommendations for optimal pre-shaping. * Set up automated grinding mills or scaife with vibration sensors. * Operate CNC-based or robotic pre-shaping tools to minimize material loss. * Calibrate gemstone size, weight, and dimensions using real-time AI-driven monitoring. * Select appropriate lap and abrasive powders based on machine-learning suggestions. * Adjust cutting parameters to optimize QC yield and minimize defects. * Implement water-efficient cooling techniques to prevent overheating. * Monitor automated tracking systems for real-time gemstone output measurement. * Maintain stone loss within AI-predicted tolerance limits for improved efficiency. * Report potential bottlenecks using predictive maintenance tools. * Ensure workstation safety by maintaining a dust-free and ergonomic setup. * Engage with AR-based training modules for continuous skill enhancement. |
| **Classroom Aids:** | |
| Whiteboard, marker pen, computer or laptop attached to LCD projector, scanner, computer speakers | |
| **Tools, Equipment and Other Requirements** | |
| Different types of sample gemstones, different faceting tools and machines such as faceting mill, calibrating machine, grinding mill, water jet etc.  Magnifying glass, Loupe, MoH scale, Weighing scale, Vernier callipers, Dops, Scaifies, Tweezers, Lamps, Sieves, Gauges. Laps and powders of different materials available such as Diamond, steel, grit laps, day lamp, Fluorescent lamp, Packets, Marking pens  Safety hand gloves, Mask, Safety shoes, Fire extinguisher, First aid kit | |

## Module 16: Operating Tumble Machine and Delivering Stones

*Mapped to G&J/N6603, v2.0*

**Terminal Outcomes:**

* Understand gemstone processing objectives to maximize yield, clarity, and quality.
* Identify and classify gemstones based on their types, families, and properties.
* Operate tumble machines efficiently with the appropriate consumables and abrasives.
* Assess and adjust tumble cycles and abrasives to ensure minimal stone loss and high-quality results.
* Maintain productivity by meeting daily targets and managing pre-shaping operations in compliance with company standards.

| Duration:*<15:00>* | Duration:*<15:00>* |
| --- | --- |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Describe gemstone processing objective of the company, e.g. maximizing yield, maximizing clarity, etc. * Describe basic gemology and properties of different types of stones, the families they belong to * List. different types of gemstones such as precious, semi-precious, synthetic etc., * Describe tumble machine operation technique and consumables required | * Apply appropriate technique to operate tumble machine * Identify the consumables required for tumble shaping * Assess the number of tumble cycles required as per the type of gemstone * Use appropriate quantity and types of abrasives to maintain quality of stones * Comply with the standards so as to keep stone loss within prescribed limits * Manage to achieve the daily target in terms of carat and number of stones worked on * Organise work for timely and hazard-free delivery of pre-shaped stones * Report problems faced or anticipated during pre-shaping of stones * Prepare documents as per company policy to inform about stone losses that occur while working |
| **Classroom Aids:** | |
| Whiteboard, marker pen, computer or laptop attached to LCD projector, scanner, computer speakers | |
| **Tools, Equipment and Other Requirements** | |
| Different types of sample gemstones  Tumbling machine, Magnifying glass, Loupe, MoH scale, Weighing scale, Vernier callipers, Dops, Scaifies, Tweezers, Lamps, Sieves, Gauges, Abrasives, Laps and powders of different materials available such as Diamond, steel, grit laps  Day lamp, Fluorescent lamp, Packets  Safety hand gloves, Mask, Safety shoes, Fire extinguisher, First aid kit | |

## Module 17: Polish the Faceted or Cabochon Gemstone

*Mapped to G&J/N6701, v2.0*

**Terminal Outcomes:**

* Use AI-powered scanning systems to verify shape, size, and marking alignment of gemstones.
* Implement automated dop/stage locking mechanisms for secure gemstone placement during cutting.
* Align laser cutting lines using computer vision for precise and accurate results.
* Configure laser parameters in real-time based on data inputs for optimal cutting.
* Integrate IoT-based machine monitoring to detect anomalies in temperature, pressure, and vibration.
* Apply AI-driven quality inspection and blockchain tracking.

| Duration:*<30:00>* | Duration:*<30:00>* |
| --- | --- |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Identify AI-powered scanning systems for verifying shape, size, and marking alignment. * Explain the role of automated dop/stage locking mechanisms for secure placement. * Describe the use of computer vision for precise laser cutting alignment. * Analyse real-time data inputs for configuring pre-programmed laser parameters. * Evaluate IoT-based machine monitoring for detecting anomalies in temperature, pressure, and vibration. * Explain AI-driven quality inspection techniques for accurate cutting. * Describe automated labelling and digital tracking systems for post-cutting traceability. * Discuss the application of blockchain-based records for end-to-end gemstone traceability. * Assess multi-machine operation dashboards for optimizing workload distribution. * Examine real-time predictive analytics for minimizing weight loss and breakage. | * Utilize AI-powered scanning systems to verify shape, size, and marking alignment. * Implement automated dop/stage locking mechanisms for secure machine placement. * Align laser cutting lines using computer vision for precision cutting. * Configure pre-programmed laser parameters based on real-time data inputs. * Integrate IoT-based machine monitoring for anomaly detection. * Apply AI-driven quality inspection to validate accurate cutting along marked lines. * Execute automated labelling and digital tracking for rough diamonds post-cutting. * Adopt blockchain-based records for tracking gemstones from rough to final stage. * Monitor multi-machine dashboards for optimizing workload and cycle times. * Utilize predictive analytics to minimize weight loss and breakage. |
| **Classroom Aids:** | |
| Whiteboard, marker pen, computer or laptop attached to LCD projector, scanner, computer speakers | |
| **Tools, Equipment and Other Requirements** | |
| Different types of gemstones  Different polishing tools and machines such as faceting mill, various types of suitable scaife, angle indexing tool, laps, dops, powder, buffs etc.  Magnifying glass, Loupe, MoH scale, Weighing scale, Vernier callipers, dops, Polishing pads, Trays, Refractometer, Spectroscope, Proportion and symmetry analyser machine, Stone scoop, Alcohol or thinners, Dops with indexing  Tweezers, Sieves, Gauges, Day lamp, Fluorescent lamp, Packets, Marking pens, Araldite, spirit burner, Water jet  Safety hand gloves, Mask, Safety shoes, Fire extinguisher, First aid kit | |

## Module 18: Making Facets on Gemstones

*Mapped to G&J/N6702, v2.0*

**Terminal Outcomes:**

* Utilize RFID and AI-assisted inspection to verify gemstone type, weight, and specifications.
* Visualize and plan faceting through CAD/CAM software for precise, optimized cuts.
* Operate CNC and automated faceting machines for accurate alignment and facet indexing.
* Apply AI recommendations to select the appropriate lap and abrasive for gemstone hardness.
* Monitor and calibrate facets in real-time using optical analysis and digital tools.
* Ensure a safe and ergonomic workspace.

| Duration:*<30:00>* | Duration:*<30:00>* |
| --- | --- |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Identify gemstone type, weight, and specifications using RFID and AI-assisted inspection. * Interpret faceting requirements through CAD/CAM software for precision planning. * Analyze AI-driven cutting simulations to optimize facets for brilliance and yield. * Explain the use of CNC and automated faceting machines for accurate angle-indexing. * Differentiate lap and abrasive selection based on AI recommendations for gemstone hardness. * Describe real-time optical analysis techniques to eliminate windowing and ensure polished facets. * Evaluate calibration techniques for maintaining facet alignment with predefined standards. * Examine precision-controlled workflows and digital monitoring to maximize QC-approved stones. * Assess smart monitoring tools for detecting faceting issues like misalignment or chipping. * Discuss the importance of a dust-free, ergonomic workspace with automated safety features. | * Verify gemstone type, weight, and specifications using RFID and AI-based inspection. * Visualize faceting plans through CAD/CAM software for accurate cutting. * Apply AI-driven simulations to determine optimal facet count. * Operate CNC or automated faceting machines for precise facet alignment. * Select AI-recommended laps and abrasives based on gemstone hardness. * Inspect polished facets using real-time optical analysis to detect windowing. * Calibrate facets to predefined gemstone standards using digital measuring tools. * Monitor and refine workflows to ensure maximum QC-approved stone output. * Detect and report faceting issues using smart monitoring and predictive maintenance tools. * Maintain a clean, ergonomic, and hazard-free workspace with automated safety mechanisms. |
| **Classroom Aids:** | |
| Whiteboard, marker pen, computer or laptop attached to LCD projector, scanner, computer speakers | |
| **Tools, Equipment and Other Requirements** | |
| Sample gemstones  Different faceting tools, faceting mills, laps, dops, scaifies, tweezers, lamps, loupes, cutters, polishing pads, trays, angle indexing tool  Different instruments for inspecting / checking gemstones such as magnifying glass, loupe, Sieves, Gauges, MoH scale, Weighing scale, Vernier callipers, Proportion and symmetry analyser machine, Stone scoop, Alcohol or thinners, Dops with indexing  Day lamp, Fluorescent lamp, Packets, Marking pens, Araldite, Spirit burner, Water jet, Abrasive  Safety hand gloves, Mask, Safety shoes, Fire extinguisher, First aid kit | |

## Module 19: Polish the Girdle of Faceted Gemstone

*Mapped to G&J/N6703, v2.0*

**Terminal Outcomes:**

* Verify gemstone specifications using RFID-based tracking and digital inventory systems.
* Inspect symmetry and facet alignment with AI-powered imaging for polishing defects.
* Classify gemstone properties using spectral analysis for hardness and transparency.
* Operate automated faceting machines with AI-driven angle-indexing for precise polishing.
* Select polishing materials based on AI-based recommendations for optimal results.
* Monitor and calibrate gemstone dimensions using digital tools to ensure accurate shape and size.

| Duration:*<30:00>* | Duration:*<30:00>* |
| --- | --- |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Identify gemstone type, weight, and quantity using RFID-based tracking and digital inventory systems. * Analyse gemstone symmetry, facet alignment, and polishing defects through AI-powered imaging. * Classify gemstone properties (soft, hard, transparent, translucent, opaque) using spectral analysis. * Explain the role of automated faceting machines and AI-driven angle-indexing in girdle polishing. * Differentiate lap, powder, and buff selection based on AI-based material analysis. * Describe digital measurement tools used to ensure girdle sharpness and symmetry. * Evaluate calibration techniques for maintaining shape and size accuracy per digital job sheet guidelines. * Examine real-time process monitoring systems to ensure sparkle, shine, and finish consistency. * Assess AI-driven alerts for detecting and reporting potential polishing issues like girdle misalignment or facet damage. * Discuss the importance of maintaining a dust-free and automated polishing workstation for safety and precision. | * Verify gemstone type, weight, and quantity using RFID-based tracking and digital inventory tools. * Inspect gemstone symmetry, facet alignment, and polishing defects using AI-powered imaging. * Categorize gemstones based on hardness and transparency using machine-assisted spectral analysis. * Operate automated faceting machines with AI-driven angle-indexing for precise girdle polishing. * Select the optimal lap, powder, and buff based on AI-based material recommendations. * Measure girdle sharpness and symmetry using digital precision tools. * Calibrate gemstone shape and size to align with digital job sheet specifications. * Monitor polishing quality using real-time process feedback systems. * Detect and report polishing issues using AI-driven anomaly detection systems. * Maintain a dust-free and automated workstation to enhance precision and safety. |
| **Classroom Aids:** | |
| Whiteboard, marker pen, computer or laptop attached to LCD projector, scanner, computer speakers | |
| **Tools, Equipment and Other Requirements** | |
| Sample gemstones  Laps of different materials, Different buffs such as wool, wood and leather and buffing powders such as chrome oxide  Polishing machine, Girdle polisher  Magnifying glass, loupe, MoH scale, Weighing scale, Vernier callipers, Angle indexing tool, Proportion and symmetry analyser machine, Stone scoop, Alcohol or thinners, Dops with indexing, scaifies, tweezers, lamps, loupes, cutters, polishing pads, trays, refractometer, spectroscope  Tweezers, Sieves, Gauges, Day lamp, Fluorescent lamp, Packets, Marking pens, Spirit burner, Water jet  Safety hand gloves, Mask, Safety shoes, Fire extinguisher, First aid kit | |

# Annexure

## Trainer Requirements

| Trainer Prerequisites | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| Minimum Educational Qualification *<Select the minimum educational requirements, such as 12th Pass, Graduate or NSQF certified.>* | **Specialization**  *<Specify the areas of specialization that are desirable.>* | **Relevant Industry Experience** | | **Training Experience** | | **Remarks** |
| ***Years*** | ***Specialization*** | ***Years*** | ***Specialization*** |  |
| 10th pass |  | 5 | Gemstone processing | 1 | Not mandatory but teaching experience in Gemstone processing |  |
| Certified in relevant CITS course as appropriate |  |  |  |  |  |  |

| Trainer Certification | |
| --- | --- |
| Domain Certification | **Platform Certification** |
| “Gemstone Processor, G&J/Q6707, Version 2.0”.  Minimum accepted score is 80%. | “Trainer, MEP/Q2601”  Minimum accepted score is 80%. |

## Assessor Requirements

| Assessor Prerequisites | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| Minimum Educational Qualification  *<Select the minimum educational requirements, such as 12th Pass, Graduate or NSQF certified.>* | **Specialization**  *<Specify the areas of specialization that are desirable.>* | **Relevant Industry Experience** | | **Training/Assessment Experience** | | **Remarks** |
| ***Years*** | ***Specialization*** | ***Years*** | ***Specialization*** |  |
| 10th pass |  | 5 | Gemstone processing | 1 | Not mandatory but teaching experience in Gemstone processing |  |
| Certified in relevant CITS course as appropriate |  |  |  |  |  |  |

| Assessor Certification | |
| --- | --- |
| Domain Certification | **Platform Certification** |
| “Gemstone Processor, G&J/Q6707, Version 2.0”.  Minimum accepted score is 80%. | “Assessor, MEP/Q2701”  Minimum accepted score is 80%. |

## Assessment Strategy

1. Assessment System Overview:

* Batches assigned to the assessment agencies for conducting the assessment on SDSM/SIP or email
* Assessment agencies send the assessment confirmation to Vocational Training Partner (VTP)/ Training Center (TC) looping Sector Skill Council (SSC)
* Assessment agency (AA) deploys the Training of Assessors (ToA) certified Assessor for executing the assessment
* SSC monitors the assessment process & records

1. Checks & Balances:

* SSC and AA confirms that the centre is available at the same address as mentioned on SDMS or SIP
* SSC and AA checks the duration of the training and Minimum Attendance Protocol
* SSC and AA checks the Assessment Start and End time to be as 10 a.m. and 5 p.m.
* If the batch size is more than 30 for STT and/ or 50 in RPL, then there should be 2 Assessors preferably.
* SSC and AA checks that the allotted time to the candidates to complete Theory & Practical Assessment is correct.
* SSC checks the mode of assessment—Online (TAB/Computer) or Offline (OMR/PP).
* SSC and AA check and confirms the number of TABs on the ground are correct to execute the Assessment smoothly.
* SSC and AA checks the availability of the Lab Equipment for the particular Job Role.

1. Assessment Quality Assurance levels / Framework:

* Question papers created by the Subject Matter Expert (SME) verified by the other SME’s.
* Questions are mapped with National Occupational Standards (NOS) and Performance Criteria (PC).
* Question Bank covers all PC under each NOS of a Qualification Pack (QP). Each question can cover one or more PCs. Which means that every question needs to be mapped with PC.
* There are sufficient number of questions in the question bank, where multiple questions are available for each PC. Typically, the number of questions should be 3 to 4 times the number of PCs.
* Each question bank has around 150 to 200 questions.
* Each question has a difficulty level mentioned against it and the question bank has a good mix of easy, medium and difficult questions. So, for example out of 200 Questions the proportion could be 25 difficult/ hard, 75 Medium and 100 Easy level questions.
* Other than the Multiple-choice question (MCQ) few questions are created for Practical and viva too. For e.g., for 150-200 QB contains approximately 10-15 Viva & 10-15 practical questions.
* Questions are periodically randomised for assessment
* Assessor and Trainers must be ToA or Training of Trainers (ToT) certified, respectively
* Assessment agency must follow the assessment guidelines to conduct the assessment

1. Types of evidence or evidence-gathering protocol:

* Assessor has to do the time-stamped & geotagged reporting from assessment location to AA and SSC.
* Center photographs with signboards and scheme specific branding are taken by assessor.
* Assessor has to collect the biometric or manual attendance sheet (stamped by TP) of the trainees during the training period.
* Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos are collected by AA from the assessor and has to share the same to SSC.

1. Method of verification or validation:

* SSC can do the surprise visit to the assessment location.
* SSC can do the random audit of the batch digitally and/or by physical visit.
* SSC can do the random audit of any candidate digitally and/or by physical visit.

1. Method for assessment documentation, archiving and access

* Hard copies of the documents are stored by AA.
* Soft copies of the documents & photographs of the assessment are uploaded / accessed from Cloud Storage by AA.
* SSC will take the backup of soft copies of the documents & photographs of the assessment in their Hard Drives.

# References

## Glossary

|  | **Sector** | | Sector is a conglomeration of diﬀerent business operations having similar business and interests. It may also be deﬁned as a distinct subset of the economy whose components share similar characteristics and interests. |
| --- | --- | --- | --- |
|  | **Sub-sector** | | Sub-sector is derived from a further breakdown based on the characteristics and interests of its components. |
|  | **Occupation** | | Occupation is a set of job roles, which perform similar/ related set of functions in an industry. |
|  | **Job role** | | Job role deﬁnes a unique set of functions that together form a unique employment opportunity in an organisation. |
|  | **Occupational Standards (OS)** | | OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts. |
|  | **Performance Criteria (PC)** | | Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task. |
|  | **National Occupational Standards (NOS)** | | NOS are occupational standards which apply uniquely in the Indian context. |
|  | **Qualiﬁcations Pack (QP)** | | QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualiﬁcations pack code. |
|  | **Unit Code** | | Unit code is a unique identiﬁer for an Occupational Standard, which is denoted by an ‘N’ |
|  | **Unit Title** | | Unit title gives a clear overall statement about what the incumbent should be able to do. |
|  | **Description** | | Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for. |
|  | **Scope** | | Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required. |
|  | **Knowledge and Understanding (KU)** | | Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational speciﬁc knowledge that an individual needs in order to perform to the required standard. |
| **Organisational Context** | | Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility. | |
| **Technical Knowledge** | | Technical knowledge is the speciﬁc knowledge needed to accomplish speciﬁc designated responsibilities. | |
| **Core Skills/ Generic Skills (GS)** | | Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today’s world. These skills are typically needed in any work environment in today’s world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles. | |
| **Electives** | | Electives are NOS/set of NOS that are identiﬁed by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives. | |
| **Options** | | Options are NOS/set of NOS that are identiﬁed by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options. | |

## Acronyms and Abbreviations

| **NOS** | National Occupational Standard(s) |
| --- | --- |
| **NSQF** | National Skills Qualiﬁcations Framework |
| **QP** | Qualiﬁcations Pack |
| **TVET** | Technical and Vocational Education and Training |
| **PC** | Performance Criteria |
| **SSC** | Sector Skill Council |
| **AA** | Assessment Agency |
| **ToT** | Training of Trainers |
| **ToA** | Training of Assessors |
| **VTP** | Vocational Training Partner |
| **TC** | Training Center |
| **SME** | Subject Matter Expert |