**APPRENTICESHIP CURRICULUM (OPTIONAL TRADE)**

**Gem & Jewellery**

**Laser Sawing Machine Operator\_Version 4.0**

**Course Code: CO022300044**

[x] **NAPS** [ ] **Non-NAPS**

**NSQF Level: 3**

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# Course Details

|  |  |  |
| --- | --- | --- |
|  | **Course Name**  | **Laser Sawing Machine Operator \_Version 4.0** |
|  | **Course Code**  | **CO022300044** |
|  | **Apprenticeship Training Duration:**1. *(2 to 4 weeks of BT is embedded in this duration as per the requirement of the establishment)*
 | **Months: 12 months (2160 Hours)** |
| 1. **Remarks**
 |  |
|  | **Credit** | **TBD** |
|  | **NSQF Level** (*Mandatory for NAPS*) | 3 **NSQC Approval Date:** 17/11/2022 |
|  | **Related NSQF-aligned qualification details** |

|  |  |  |  |
| --- | --- | --- | --- |
| **S. No.** | **QP/ Qualification/ NOS Name** | **QP/ NOS Code & Version** | **NQR Code** |
| 1 | Laser Sawing Machine Operator - Diamond Processing | G&J/Q4404, Version 4.0 | 2022/GJ/GJSCI/06708 |

 |
|  | **Brief Job Role Description** | The individual at work needs to cut the rough diamond along the marking by fixing it on a dop or cassette or holder, then slicing it using the laser machine. A laser sawing operator is responsible for delivering a perfect cut of roughs in the stipulated time while minimizing weight loss and breakage. Also known as Laser Cutter or Laser Operator or Laser Sawyer, the laser machine operator uses the laser machine to cut the diamond |
|  | **NCO-2015 Code & Occupation** (*Access the NCO 2015 volumes from:* [*https://labour.gov.in/organizationsofmole/directorate-general-employment-training-dget*](https://labour.gov.in/organizationsofmole/directorate-general-employment-training-dget) ) | NCO-2015/8189.0401 Rough Cutting and Sawing |
|  | **Minimum Eligibility Criteria** *(Educational and/ or Technical Qualification)* | 9th Class  |
|  | **Entry Age of Apprenticeship** | 18 years |
|  | **Any Licensing Requirements** (*wherever applicable*) | NA |
|  | **Is the Job Role amenable to Persons with Disability** | [ ]  **Yes** [x]  **No****If yes, check the applicable type of Disability**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| [ ]  **Locomotor Disability** | [ ]  **Leprosy Cured Person** | [ ]  **Cerebral Palsy**  | [ ]  **Dwarfism** | [ ]  **Muscular Dystrophy** |
| [ ]  **Acid Attack Victims** | [ ]  **Blindness** | [ ]  **Low Vision** | [ ]  **Deaf**  | [ ]  **Hard of Hearing** |
| [ ]  **Speech and Language Disability** | [ ]  **Intellectual Disability** | [ ]  **Specific Learning Disabilities** | [ ]  **Autism Spectrum Disorder** | [ ]  **Mental Illness** |
| [ ]  **Multiple Sclerosis** | [ ]  **Parkinson's Disease** | [ ]  **Haemophilia** | [ ]  **Thalassemia** | [ ]  **Sickle Cell Disease** |
| [ ]  **Multiple Disabilities** |  |  |  |  |
|  |

 |
| **Remarks:** |
|  | **Submitting Body Details** | **Name:** Gems & Jewellery Skill Council of India**E-mail ID:** ceo@gjsci.org**Contact Number:** +91 22 28293940 |
|  | **Certifying Body** | Gems & Jewellery Skill Council of India AndIndustry partners of Gems & Jewellery Skill Council of India |
|  | **Employment Avenues/Opportunities** | **1) Diamond manufacturing units in India:** The apprentice may be employed with the diamond manufacturing units in India.**2) Education and Training: T**hey may also take up the role of the instructor in this field where they can impart their manufacturing knowledge to the aspiring students |
|  | **Career Progression** | **Vertical progression**1. Supervisor – Laser Sawing Machine Operator
 |
|  | **Trainer’s Qualification & Experience:** | 12th Pass and 5 years of Relevant Industry Experience and 2-3 years of Training Experience |
|  | **Curriculum Creation Date** | 23/02/2023 |
|  | **Curriculum Valid up to Date** | 24/02/2025 |
|  | **List of Other Supporting Documents** (*wherever applicable*) | NA |

# Module Details

| **S. No** | **Module/NOS Name, Code, Version** | **Outcomes** | **Assessment Marks** | **Passing Percentage** |
| --- | --- | --- | --- | --- |
| **Th.** | **Pr.** | **Th.** | **Pr.** |
|  | **Introduction and orientation** | * Identify basic process of jewellery manufacturing.
* Interact with different departments and key personnel of departments in the organization.
* Identify HR policies, timings to be followed in the organisation, leaves, holidays, disciplinary policies etc.
* List the responsibilities of a Laser Sawing Machine Operator.
 |  |  |  |  |
|  | **Maintain health and safety at workplace****G&J/N9902****Version: 2.0** | * Record and report potential safety issues while working at workplace.
* Practice safety procedures at workplace.
* Carryout work as per laid down instructions and guidelines for preventing danger or damage of the machines and report any abnormal observation.
* Sanitize and disinfect the one's work area regularly.
* Maintain cleanliness and hygiene of workplace.
* Escalate issues related to cleanliness, hygiene and hazardous material to concerned department.
* Deal with emergencies and accidents such as fires and natural calamities at the workplace.
* Practice use of fire-fighting equipment available at the workplace.
* Practice safe material handling practices for lifting the heavy load.
* Practice first-aid practices.
* Inspect the work area, tools, equipment and materials for their cleanliness.
* Store the material and equipment in the correct location and in good condition.
 | 3.0 | 17.0 | 50% | 50% |
|  | **Fix the rough diamond on dop or cassette or holder****G&J/N4401****Version: 2.0** | * Segregate diamond appropriately according to its features.
* Read the manuals defining different standards as specified by Industry, Company, GIA, IGI or HRD.
* Carry out pre-operation activities such as checking for defects, material collection etc. before placing diamond in the holder.
* Check the accuracy to stick the diamond before laser cutting.
* Stick the diamond into JIG and set it into setup of computerized settings.
* Match the company’s policies on acceptable limits of weight loss, incentives, delivery standards, safety practices and Hazards, security and performance measurement.
 | 4.0 | 16.0 | 50% | 50% |
|  | **Cut rough diamond using a laser sawing machine** **G&J/N4402****Version: 2.0** | * Check the accuracy of cutting within timeframe.
* Carry out various methods of laser cutting.
* Carry out process of Pai sawing.
* Maintain quality of cutting as per the organizational standards.
* Maintain and achieve productivity as per organisational standards.
* Carry out defects controlling techniques to identify defects in the workpiece.
* Identify potential ways that may cause damage to a diamond.
* Carry out techniques of cutting a rough diamond.
* Report diamond losses via documentation as per company policy.
* Suggest improvements in order to reduce loss.
 | 9.0 | 31.0 | 50% | 50% |
| 5. | **Employability****Skills (30 Hours)****DGT/VSQ/N0101****Version 1.0** | * Discuss own strengths and weaknesses and analyse the gaps to ensure continuous improvement.
* Discuss the measures to be undertaken to utilise time effectively thereby achieving maximum productivity.
* List the characteristics of innovative individuals
* List the levels of Maslow Hierarchy of needs
* List the traits of effective team
* Discuss tips for stress management
* Discuss the importance of good work ethics
* Discuss how to manage an enterprise
* Describe how to plan effective strategies for solving problems and improving work culture within the team.
* List the various types of digital marketing techniques.
* Discuss the types and importance of e-commerce in promoting businesses.
* List the various types of online banking services being used widely.
* Discuss the procedure to apply for bank finances
* List the elements of a proposal to attract future business opportunities and prospective clients.
* Explain how to conduct entrepreneurial programs to identify business opportunities, generate employment and increase clientele.
* Understand the make in India campaign
* Discuss the importance of Swachh Bharat Abhiyan
* Understand the importance of entrepreneurship
* Describe the traits of successful entrepreneur
* List the types of enterprises
* Understand the importance of effective speaking and listening
* Discuss the importance of problem solving
* Discuss how to deal with failures
* Describe the core keys of marketing
* Discuss ways to manage risks at workplace
* Show how to analyse a situation to identify gaps for improving the work process.
* Demonstrate the procedure to plan the time taken to perform various tasks effectively.
* Describe how market research is carried out
* Role play the characteristics of an effective entrepreneur and leader
* Demonstrate on how to identify new business opportunities
* Prepare a sample plan to solve problems and improve productivity at the workplace.
* Demonstrate the procedure to operate a computer for digital marketing, e-commerce, branding, etc.
* Show how to use services such as NEFT, IMPS, UPI, RTGS for online banking.
 | 20.0 | 30.0 | 70% | 70% |
| **Total Marks** | **36** | **94** |  |  |

# Glossary

|  |  |
| --- | --- |
| **Term** | **Description** |
| **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. |
| **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. |
| **National Occupational Standards (NOS)** | NOS are occupational standards which apply uniquely in the Indian context. |

# Acronyms

|  |  |
| --- | --- |
| **Acronym**  | **Description** |
| **NOS** | National Occupational Standard(s) |
| **NSQF** | National Skills Qualiﬁcations Framework |
| **QP** | Qualiﬁcations Pack |
| **PwD** | Persons with Disability |
| **OEM** | Original Equipment Manufacturer |

# Annexure 1: Tools and Equipment

## List of Tools and Equipment

The tools and equipment required are:

|  |  |  |  |
| --- | --- | --- | --- |
| **S. No.** | **Tool / Equipment Name** | **Specification** | **Quantity for specified Batch size** |
| 1 | Plate for mixing cement |   | 10 |
| 2 | Fevicol | The quantity depends on the no. of diamonds students work upon | 50 gr/batch |
| 3 | 10x eyeglass | It should be given to all trainees individually as the part of training kit.  | 30 |
| 4 | Acetone | The quantity depends on the no. of diamonds students work upon | 200 ml/batch |
| 5 | Oven |   | 1 |
| 6 | Whitener | The quantity depends on the no. of diamonds students work upon | 200 ml/batch |
| 7 | Tweezers  | It should be given to all trainees individually as the part of training kit | 30 |
| 8 | Digital CCD camera unit with screen |   | 2 |
| 9 | Laser dies from 3 no. to 15, laser blade |   |   |
| 10 |  laser sawing machine with LED display & mouse |   | 1 |
| 11 | Paper Packets For diamonds With Safety Backing Paper |   | 90 |
| 12 | Padika/packets with planning labels |   | 90 |
| 13 | Emery  | It is better to use EMERY only because emery powder makes scratches on diamond during removing carbon  | 6 |
| 14 | Shade light |   | 30 |
| 15 | Cloth |   | 0 |
| 16 | Plate |   | 0 |
| 17 | Toluin |   | 0 |
| 18 | water |   | 0 |
| 19 | Cement |   | 500 gr./batch |
| 20 | First Aid Kit |   | 1 |
| 21 | Fire Extinguisher |   | 2 |
| 22 | Protective Safety Hand Gloves |   | 0 |
| 23 | Protective eyewear |   | 0 |
| 24 | Sulphuric Acid |   | 1 ltr/batch |
| 25 | Perchloric acid |   | 500 ml/batch |
| 26 | Nitric Acid |   | 300 ml/batch |
| 27 | Hotplate, Steel Plates and Bowls  |   | 10 |
| 28 | Sodium Nitric | Powder | 250 gr/batch |
| 29 | Plier |   | 30 |
| 30 | Cloth | Apron type cloth to wear for safety | 30 |
| 31 | Tweezers Strainer (Galni), |   | 30 |
| 32 | Tweezers  | It should be given to all trainees individually as the part of training kit | 30 |
| 33 | Scoop (Supdi | It should be given to all trainees individually as the part of training kit | 30 |
| 34 | Beaker |   | 30 |
| 35 | Test tube, Spoon, Plastic Tub |   | 30 |
| 36 | Steel plates with compartments gauge |   | 30 |
| 37 | Hydromax flame |   | 30 |
| 38 | Grading Tray |   | 0 |
| 39 | Cleaning Cloth/Gem Cloth |   | 30 |
| 40 | Weighing balance | In carat up to 100.00ct | 1 |
| 41 | Stock of diamond |   |   |

##

## Classroom Aids

The aids required to conduct sessions in the classroom are:

1. Projector
2. Computer/laptops
3. Internet connectivity
4. Whiteboard

# Annexure 2: Assessment Strategy

 This section includes the processes involved in identifying, gathering, and interpreting information to evaluate the apprentice on the required competencies of the program.

1. Assessment System Overview:
* Batches assigned to the assessment agencies for conducting the assessment on SIP or email
* Assessment agencies send the assessment confirmation to VTP/TC looping SSC
* Assessment agency deploys the ToA certified Assessor for executing the assessment
* SSC monitors the assessment process & records
1. Testing Environment – The assessor should:
* Confirm that the centre is available at the same address as mentioned on SDMS or SIP
* Check the duration of the training.
* Check 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.
* Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.
* Check the mode of assessment—Online (TAB/Computer) or Offline (OMR/PP).
* Confirm the number of TABs on the ground are correct to execute the Assessment smoothly.
* Check the availability of the Lab Equipment for the particular Job Role.
1. Assessment Quality Assurance levels/Framework:
* Question papers created by the SME are verified by the other subject Matter Experts
* Questions are mapped with NOS and PC
* Question Bank covers all performance criteria (PC) under each NOS of a 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.
* Assessor must be ToA certified & trainer must be ToT Certified
* Assessment agency must follow the assessment guidelines to conduct the assessment
1. Types of evidence or evidence-gathering protocol:
* Time-stamped & geotagged reporting of the assessor from assessment location
* Centre photographs with signboards and scheme specific branding
* Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period
* Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos
1. Method of verification or validation:
* Surprise visit to the assessment location
* Random audit of the batch
* Random audit of any candidate
1. Method for assessment documentation, archiving, and access
* Hard copies of the documents are stored
* Soft copies of the documents & photographs of the assessment are uploaded / accessed from Cloud Storage
* Soft copies of the documents & photographs of the assessment are stored in the Hard Drives

# Annexure 3: Mode of Training

The following Modules/NOS may also be delivered online for which the resources are provided in the given table.

|  |  |  |  |
| --- | --- | --- | --- |
| **S. No.** | **Module Name/NOS Name (As Per Curriculum)** | **Name of Mapped Online Component** | **URL of Mapped Online Component** |
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**Infra requirement:**

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