

# JEWELSMITH

## COMPETENCY BASED CURRICULUM

(Duration: 1 Yr. 3 Months)

## APPRENTICESHIP TRAINING SCHEME (ATS)

NSQF LEVEL- 4



India  
कौशल भारत - कुशल भारत  
SECTOR – GEMS AND JEWELLERY



GOVERNMENT OF INDIA  
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP  
DIRECTORATE GENERAL OF TRAINING



Directorate General of Training



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कौशल भारत - कुशल भारत

*Jewel Smith*

# JEWEL SMITH

(Revised in 2018)

## APPRENTICESHIP TRAINING SCHEME (ATS)



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Developed By

Ministry of Skill Development and Entrepreneurship  
Directorate General of Training  
**CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE**  
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1. Jewel Cast & Techno Pvt. Ltd., Ahmedabad
2. N. S. Jewels – Ahmedabad
3. Maheshbhai I. Soni Jewellers - Ahmedabad
4. C.H.Jewellers Pvt. Ltd., Vadodara
5. Gandevikar Jewellers Pvt. Ltd., Vadodara
6. Industrial Training Institute, Waghodiya
7. R.D.D. Office Vadodara

Special acknowledgement is expended by DGT to the following expert members who had contributed immensely in this curriculum.

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### 1.1 Apprenticeship Training Scheme under Apprentice Act 1961

The Apprentices Act, 1961 was enacted with the objective of regulating the programme of training of apprentices in the industry by utilizing the facilities available therein for imparting on-the-job training. The Act makes it obligatory for employers in specified industries to engage apprentices in designated trades to impart Apprenticeship Training on the job in industry to school leavers and person having National Trade Certificate (ITI pass-outs) issued by National Council for Vocational Training (NCVT) to develop skilled manpower for the industry. There are four categories of apprentices namely; **trade apprentice, graduate, technician and technician (vocational) apprentices.**

Qualifications and period of apprenticeship training of **trade apprentices** vary from trade to trade. The apprenticeship training for trade apprentices consists of basic training followed by practical training. At the end of the training, the apprentices are required to appear in a trade test conducted by NCVT and those successful in the trade tests are awarded the National Apprenticeship Certificate.

The period of apprenticeship training for graduate (engineers), technician (diploma holders and technician (vocational) apprentices is one year. Certificates are awarded on completion of training by the Department of Education, Ministry of Human Resource Development.

### 1.2 Changes in Industrial Scenario

Recently we have seen huge changes in the Indian industry. The Indian Industry registered an impressive growth during the last decade and half. The number of industries in India have increased manifold in the last fifteen years especially in services and manufacturing sectors. It has been realized that India would become a prosperous and a modern state by raising skill levels, including by engaging a larger proportion of apprentices, will be critical to success; as will stronger collaboration between industry and the trainees to ensure the supply of skilled workforce and drive development through employment. Various initiatives to build up an adequate infrastructure for rapid industrialization and improve the industrial scenario in India have been taken.

### **1.3 Reformation**

The Apprentices Act, 1961 has been amended and brought into effect from 22<sup>nd</sup> December, 2014 to make it more responsive to industry and youth. Key amendments are as given below:

- Prescription of number of apprentices to be engaged at establishment level instead of trade-wise.
- Establishment can also engage apprentices in optional trades which are not designated, with the discretion of entry level qualification and syllabus.
- Scope has been extended also to non-engineering occupations.
- Establishments have been permitted to outsource basic training in an institute of their choice.
- The burden of compliance on industry has been reduced significantly.



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### 2.1 GENERAL

Directorate General of Training (DGT) under Ministry of Skill Development & Entrepreneurship offers range of vocational training courses catering to the need of different sectors of economy/ Labour market. The vocational training programmes are delivered under aegis of National Council of Vocational Training (NCVT). Craftsman Training Scheme (CTS) and Apprenticeship Training Scheme (ATS) are two pioneer programmes of NCVT for propagating vocational training.

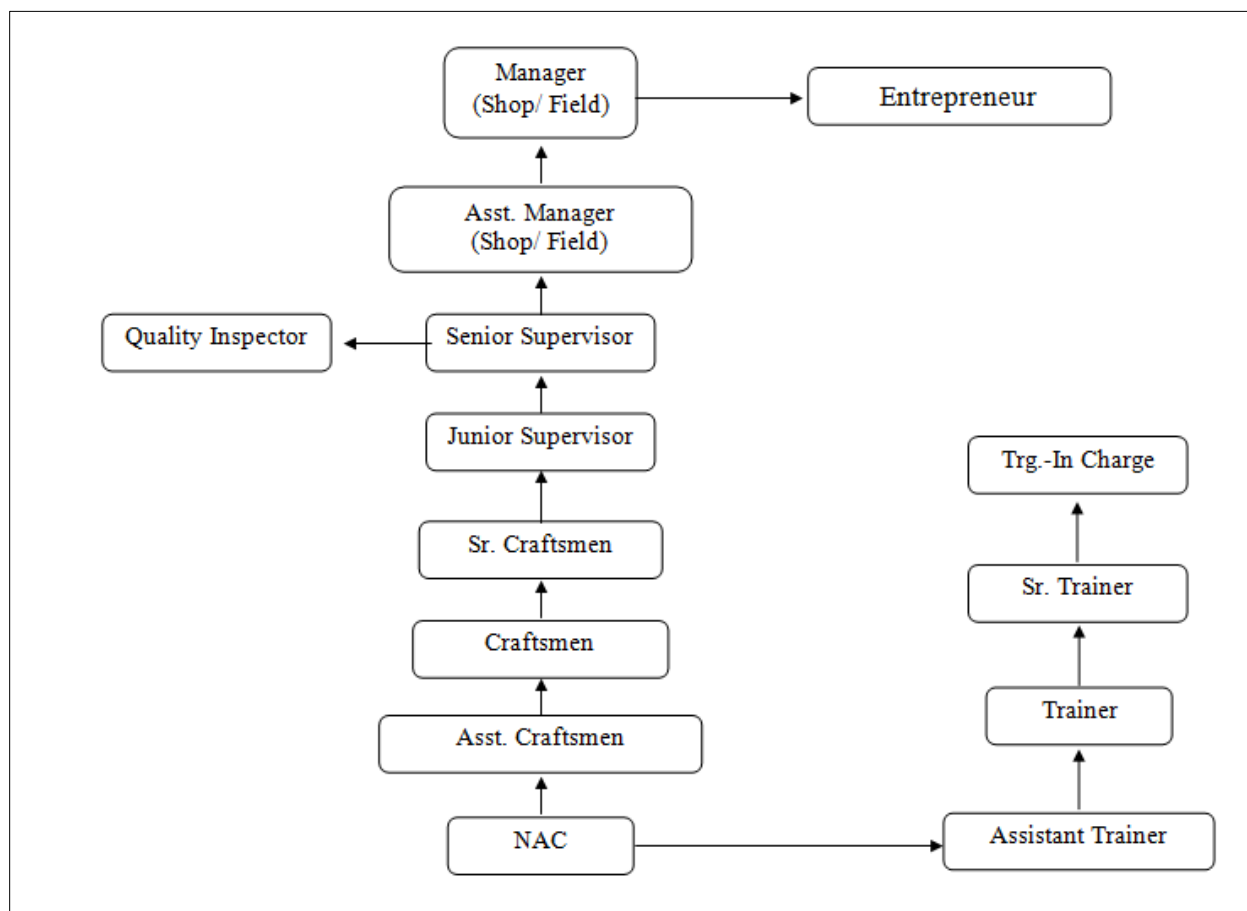
Jewel Smith trade under ATS is one of the most popular courses delivered nationwide through different industries. The course is of one year three months (01 Blocks) duration. It mainly consists of Domain area and Core area. In the Domain area Trade Theory & Practical impart professional - skills and knowledge, while Core area - Workshop Calculation and science, Engineering Drawing and Employability Skills imparts requisite core skills & knowledge and life skills. After passing out the training programme, the trainee is being awarded National Apprenticeship Certificate (NAC) by NCVT having worldwide recognition.

**Broadly candidates need to demonstrate that they are able to:**

- Read & interpret technical parameters/document, plan and organize work processes, identify necessary materials and tools;
- Perform task with due consideration to safety rules, accident prevention regulations and environmental protection stipulations;
- Apply professional skill, knowledge, core skills & employability skills while performing jobs and solve problem during execution.
- Check the job/assembly as per drawing for functioning, identify and rectify errors in job/assembly.
- Document the technical parameters related to the task undertaken.

## 2.2 CAREER PROGRESSION PATHWAYS:

- Can join Crafts Instructor Training Scheme (CITS) in the trade for becoming instructor in ITIs.
- Indicative pathways for vertical mobility.



## 2.3 COURSE STRUCTURE:

Table below depicts the distribution of training hours across various course elements during a period of one year (*Basic Training and On-Job Training*): -

**Total training duration details: -**

Time (in months)	1-3	4 - 15
Basic Training	Block– I	-----
Practical Training (On - job training)	----	Block – I

Duration	Basic Training	On-Job Training	Total
<b>For 02 yrs. Course</b> (Non-Engg.)	500 hrs.	3640 hrs.	4140 hrs.
<b>For 01 yr. Course</b> (Non-Engg.)	500 hrs.	2080 hrs.	2580 hrs.

**A. Basic Training**

For 02 yrs. Course (Non-Engg.):- **Total 03 months:** 03 months in 1<sup>st</sup>yr. only

For 01 yr. Course (Non-Engg.):- **Total 03 months:** 03 months in 1<sup>st</sup> yr.

Sl. No.	Course Element	Total Notional Training Hours (For 01 yr. Course)
1	Professional Skill (Trade Practical)	270
2	Professional Knowledge (Trade Theory)	120
3	Employability Skills	110
	<b>Total (including Internal Assessment)</b>	<b>500</b>

**B. On-Job Training:-**

For 01 yr. Course (Non-Engg.) :- ( **Total: 12months**)

Notional Training Hours for On-Job Training: 2080 Hrs.

**C. Total training hours:-**

**2.4 ASSESSMENT & CERTIFICATION:**

The trainee will be tested for his skill, knowledge and attitude during the period of course and at the end of the training programme as notified by Govt of India from time to time. The Employability skills will be tested in first two semesters only.

a) The **Internal assessment** during the period of training will be done by **Formative assessment method** by testing for assessment criteria listed against learning outcomes. The training institute have to maintain individual *trainee portfolio* as detailed in assessment guideline. The marks of internal assessment will be as per the template (Annexure – II).

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b) The final assessment will be in the form of summative assessment method. The All India Trade Test for awarding NAC will be conducted by NCVT on completion of course as per guideline of Govt of India. The pattern and marking structure is being notified by govt of India from time to time. **The learning outcome and assessment criteria will be basis for setting question papers for final assessment. The examiner during final examination will also check individual trainee's profile as detailed in assessment guideline before giving marks for practical examination.**

### **2.4.1 PASS REGULATION**

The minimum pass percent for Practical is 60% & minimum pass percent for Theory subjects 40%. The candidate pass in each subject conducted under all India trade test.

### **2.4.2 ASSESSMENT GUIDELINE**

Appropriate arrangements should be made to ensure that there will be no artificial barriers to assessment. The nature of special needs should be taken into account while undertaking assessment. Due consideration should be given while assessing for team work, avoidance/reduction of scrap/wastage and disposal of scarp/wastage as per procedure, behavioral attitude, sensitivity to environment and regularity in training. The sensitivity towards OSHE and self-learning attitude are to be considered while assessing competency.

Assessment will be evidence based comprising the following:

- Job carried out in labs/workshop
- Record book/ daily diary
- Answer sheet of assessment
- Viva-voce
- Progress chart
- Attendance and punctuality
- Assignment
- Project work

Evidences of internal assessments are to be preserved until forthcoming semester examination for audit and verification by examination body. The following marking pattern to be adopted while assessing:

<b>Performance Level</b>	<b>Evidence</b>
<b>(a) Weight age in the range of 60 -75% to be allotted during assessment</b>	
For performance in this grade, the candidate with occasional guidance and showing due regard for safety procedures	<ul style="list-style-type: none"><li>• Demonstration of good skill in the use of hand tools, machine tools and workshop equipment</li></ul>

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<p>and practices, has produced work which demonstrates attainment of an acceptable standard of craftsmanship.</p>	<ul style="list-style-type: none"><li>• Below 70% tolerance dimension/accuracy achieved while undertaking different work with those demanded by the component/job/set standards.</li><li>• A fairly good level of neatness and consistency in the finish</li><li>• Occasional support in completing the project/job.</li></ul>
<p><b>(b) Weight age in the range of above 75% - 90% to be allotted during assessment</b></p>	
<p>For this grade, the candidate, with little guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of a reasonable standard of craftsmanship.</p>	<ul style="list-style-type: none"><li>• Good skill levels in the use of hand tools, machine tools and workshop equipment</li><li>• 70-80% tolerance dimension/accuracy achieved while undertaking different work with those demanded by the component/job/set standards.</li><li>• A good level of neatness and consistency in the finish</li><li>• Little support in completing the project/job</li></ul>
<p><b>(c) Weight age in the range of above 90% to be allotted during assessment</b></p>	
<p>For performance in this grade, the candidate, with minimal or no support in organization and execution and with due regard for safety procedures and practices, has produced work which demonstrates attainment of a high standard of craftsmanship.</p>	<ul style="list-style-type: none"><li>• High skill levels in the use of hand tools, machine tools and workshop equipment</li><li>• Above 80% tolerance dimension/accuracy achieved while undertaking different work with those demanded by the component/job/set standards.</li><li>• A high level of neatness and consistency in the finish.</li><li>• Minimal or no support in completing the project.</li></ul>

Brief description of Job roles:

**Jewellery, Engraving and Precious Metal Working** identification and processing of jewels, making and engraving metal ornaments, inlaying metal pieces, etc., and ensures desired finish with minimum wastage. Examining, selecting cutting and processing real and artificial pearls and stones according to design or customer's specifications. Selects artistic designs for engraving inlaying or embossing metals, other than ornaments, and workers to reproduce them on articles for sale, decoration or display. Checks purity of gold and silver to determine value of used or new ornaments. May be experienced or specialized in any particular type of work and be designed accordingly. May assist customers in selecting pearls and jewels, and determining design or ornaments to be made.

Work as a Jewelry Designer or CAD Operator as well working as a CAM machine operator, diamond assorter , gem lab assistant or store manager to keep inventory of tools and equipment and machinery. Even working with self entrepreneur.

**Jewellery, Goldsmith and Silversmith Workers, other** include all jewellery and precious metal workers not elsewhere classified.

Reference NCO: **3122.6400 Supervisor, Jewellery, Engraving and Precision Metal Workers**

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NSQF level for Jewel Smith trade under ATS: **Level 4**

As per notification issued by Govt. of India dated- 27.12.2013 on National Skill Qualification Framework total 10 (Ten) Levels are defined.

Each level of the NSQF is associated with a set of descriptors made up of five outcome statements, which describe in general terms, the minimum knowledge, skills and attributes that a learner needs to acquire in order to be certified for that level.

Each level of the NSQF is described by a statement of learning outcomes in five domains, known as level descriptors. These five domains are:

- a. Process
- b. professional knowledge,
- c. professional skill,
- d. core skill and
- e. Responsibility.

The Broad Learning outcome of Jewel Smith trade under ATS mostly matches with the Level descriptor at Level- 4.

The NSQF level-4 descriptor is given below:

Level	Process Required	Professional Knowledge	Professional Skill	Core Skill	Responsibility
Level 4	Work in familiar, predictable, routine, situation of clear choice.	Factual knowledge of field of knowledge or study	Recall and demonstrate practical skill, routine and repetitive in narrow range of application, using appropriate rule and tool, using quality concepts	Language to communicate written or oral, with required clarity, skill to basic Arithmetic and algebraic principles, basic understanding of social political and natural environment.	Responsibility for own work and learning.

<b>Name of the Trade</b>	<b>Jewel Smith</b>
<b>NCO - 2015</b>	3122.6400 Supervisor, Jewellery, Engraving and Precision Metal Workers
<b>NSQF Level</b>	Level – 4
<b>Duration of Apprenticeship Training</b> (Basic Training + On-Job Training)	3 months + One year (01 Blocks of 15 month duration).
<b>Duration of Basic Training</b>	a) Block –I : 3 months <b>Total duration of Basic Training: 3 months</b>
<b>Duration of On-Job Training</b>	a) Block–I: 12 months <b>Total duration of Practical Training: 12 months</b>
<b>Entry Qualification</b>	Passed 8th class examination from a recognised school.
<b>Selection of Apprenticeship</b>	The apprentices will be selected as per Apprenticeship Act amended time to time.
<b>Instructors Qualification for Basic Training</b>	As per ITI instructors qualifications as amended time to time for the specific trade.
<b>Infrastructure for Basic Training</b>	As per related Trade of ITI
<b>Examination</b>	The internal examination/ assessment will be held on completion of each block. Final examination for all subjects will be held at the end of course and same will be conducted by NCVT.
<b>Rebate to Ex-ITI Trainees</b>	Nil
<b>CTS trades eligible for Jewel Smith Apprenticeship</b>	1. Jewel smith

**Note:**

- Industry may impart training as per above time schedule for different block, however this is not fixed. The industry may adjust the duration of training considering the fact that all the components under the syllabus must be covered. However the flexibility should be given keeping in view that no safety aspects is compromised.
- For imparting Basic Training the industry to tie-up with ITIs having such specific trade and affiliated to NCVT.

### **6.1 GENERIC LEARNING OUTCOME**

The following are minimum broad Common Occupational Skills/ Generic Learning Outcome after completion of the Jewel Smith course of 01 year 03 months duration under ATS.

#### **Block I:-**

1. Recognize & comply safe working practices, environment regulation and housekeeping.
2. Explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality.
3. Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.
4. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.
5. Plan and organize the work related to the occupation.

### **6.2 SPECIFIC LEARNING OUTCOME**

#### **Block – I**

1. Practice and understand precautions to be followed while working in finished jobs.
2. Prepare different types of documentation as per industrial need by different methods of recording information.
3. Refining of gold and alloying conversion from 24 kt to 22kt and other varieties..
4. Recovery of gold to 999 fineness.
5. Finishing Polishing and Repairing.
6. Gold smithing and jewellery makings involving different operations.
7. Manufacturing shining Engraving and colour mina working etc.
8. Electroplating of gold, alloy, rhodium for decoration purpose.
9. Fit parts together in set order using different textures with special effects.
10. Manufacture and assemble work as per drawing (customer requirements) with well developed skills, maintaining proper procedures and responsibility for own and other's work.

**NOTE:** Learning outcomes are reflection of total competencies of a trainee and assessment will be carried out as per assessment criteria.

## 7. LEARNING OUTCOME WITH ASSESSMENT CRITERIA

GENERIC LEARNING OUTCOME	
LEARNING OUTCOMES	ASSESSMENT CRITERIA
1. Recognize & comply safe working practices, environment regulation and housekeeping.	1. 1. Follow and maintain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements.
	1. 2. Recognize and report all unsafe situations according to site policy.
	1. 3. Identify and take necessary precautions on fire and safety hazards and report according to site policy and procedures.
	1. 4. Identify, handle and store / dispose off dangerous/unsalvageable goods and substances according to site policy and procedures following safety regulations and requirements.
	1. 5. Identify and observe site policies and procedures in regard to illness or accident.
	1. 6. Identify safety alarms accurately.
	1. 7. Report supervisor/ Competent of authority in the event of accident or sickness of any staff and record accident details correctly according to site accident/injury procedures.
	1. 8. Identify and observe site evacuation procedures according to site policy.
	1. 9. Identify Personal Protective Equipment (PPE) and use the same as per related working environment.
	1. 10. Identify basic first aid and use them under different circumstances.
	1. 11. Identify different fire extinguisher and use the same as per requirement.
	1. 12. Identify environmental pollution & contribute to avoidance of same.
	1. 13. Take opportunities to use energy and materials in an environmentally friendly manner
	1. 14. Avoid waste and dispose waste as per procedure
	1. 15. Recognize different components of 5S and apply the same in the working environment.
2. Select and ascertain measuring instrument	2. 1. Select appropriate measuring instruments such as micrometers, vernier calipers, dial gauge, bevel

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and measure dimension of components and record data.	protector and height gauge (as per tool list).
	2. 2. Ascertain the functionality & correctness of the instrument.
	2. 3. Measure dimension of the components & record data to analyse the with given drawing/measurement.
3. Explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality.	3. 1. Explain the concept of productivity and quality tools and apply during execution of job.
	3. 2. Understand the basic concept of labour welfare legislation and adhere to responsibilities and remain sensitive towards such laws.
	3. 3. Knows benefits guaranteed under various acts
4. Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.	4. 1. Explain the concept of energy conservation, global warming, pollution and utilize the available resources optimally & remain sensitive to avoid environment pollution.
	4. 2. Dispose waste following standard procedure.
5. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.	5. 1. Explain personnel finance and entrepreneurship.
	5. 2. Explain role of Various Schemes and Institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non financing support agencies to familiarizes with the Policies /Programmes & procedure & the available scheme.
	5. 3. Prepare Project report to become an entrepreneur for submission to financial institutions.
6. Plan and organize the work related to the occupation.	6. 1. Use documents, drawings and recognize hazards in the work site.
	6. 2. Plan workplace/ assembly location with due consideration to operational stipulation
	6. 3. Communicate effectively with others and plan project tasks
	6. 4. Assign roles and responsibilities of the co-trainees for execution of the task effectively and monitor the same.
<b>SPECIFIC OUTCOME</b>	

**Block-I**

**(Section:10 in the competency based curriculum)**

*Assessment Criteria i.e. the standard of performance, for each specific learning outcome mentioned under **Block – I**(section: 10) must ensure that the trainee works in familiar, predictable, routine, situation of clear choice. Assessment criteria should broadly cover the aspect of **Planning** (Identify, ascertain, etc.); **Execution** apply factual knowledge of field of knowledge, recall and demonstrate practical skill during performing the work in routine and repetitive in narrow range of application, using appropriate rule and tool, complying with basic arithmetic and algebraic principles and language to communicate in written or oral with required clarity; **Checking/ Testing** to ensure functionality during the assessment of each outcome. The assessments parameters must also ascertain that the candidate is responsible for his/her own work and learning.*



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**BASIC TRAINING (Block – I)****Duration: (03) Three Months**

Week No.	Professional Skills	Professional Knowledge
1	Practice on – a. Refining of Gold & alloying conversion from 24 Kt to 22 Kt and other varieties. b. Refining gold & alloys/scraps using Aqua Regea Process.	Safety & Housekeeping, Chemical hazards involved due to lead etc. familiarization of 14-18 Karat Gold. Purity of Gold in terms of testing & measuring methods of Karats of fineness, Hall marking. Different alloy composition and properties – physical and chemical. Spur is 1417.
2-3	Practice on Recovery of Gold to 999 Fineness with minimum losses – a. Recovery of precious metal from dust. b. Chemical Refining Process	Different joining process, screw – filing, soldering, brazing, welding, composition of soldering alloy, flux etc.
4-5	Practice on Finishing, Polishing & Repairing – a. Finishing, cutting, Pre-polishing, Poetizing b. Hand Polishing and Burnishing c. Motor polishing and Buffing d. Thumbling and magnetic Polishing techniques e. Ultrasonic clearing and Steam cleaning f. Use of different Brushes, Felt laps, Cotton buffs, Grinding wheels etc.	Art of value – addition, methods of polishing – manual & by machine, electro-chemical means. Abrasive & non-abrasive media.  Equipment – rotary – barrel or tumbler, vibratory barrel, centrifugal planetary barrel, centrifugal disc, magnetic barrel.
6-9	Practice on Basic Goldsmithing and jewellery making skills – a. Filling b. Cutting c. Drilling d. Soldering e. Alloying f. Forging g. Wire drawing h. Sheet Roling i. Red Rolling	Finishing process. Smoothing against orange effect traces of flasher burry solder smears. Finishing media & equipment cutting, burnishing. Different compounds, wheels and abrasive devices used in hand finishing operations, vibratory, rotary and centrifugal processes used in mass finishing of jewellery, their suitability for various production requirements, types of media and compounds sued to achieve right

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	<p>j. Extruding k. Forging l. Blanking m. Stamping n. Striking o. Spinning p. Chain making q. Bending r. Raising s. Embossing machining t. Practice on Joining by using</p> <ol style="list-style-type: none"> <li>1. Blow pipe techniques</li> <li>2. Soldering</li> <li>3. Preparation of solder</li> </ol>	<p>finish.</p> <p>Annealing for relieving stress/strain due to bending, overworking etc.</p> <p>Base metal – Ag, Cu, Process of Coating with shinning materials</p> <p>Jewellery designing techniques Country wide variation, difference in man &amp; women jewellery.</p> <p>Different variety of jewellery – Rings, bangles, earring, chain, locket, necklace etc.</p> <p>Filigree work</p> <p>Different Mina work – manipuri, Jaipuri styles</p>
10	<p>Practice of manufacturing shinning.</p> <p>Practice on Engraving</p> <p>Practice on Colour mina working, filigree different mina styles eg. Manipuri, Jaipuri.</p> <p>Practice of annealing potation.</p>	<p>Stamping – process comparison with investment casting process. Typical items produced by stamping. Blanking &amp; coining. Role of tool makers in stampings.</p>
	<p>Practice on electroplating of Gold, alloy, rhodium for decorative applications.</p>	<ol style="list-style-type: none"> <li>a. Electroplating of Gold, Gold alloy, rhodium and Platinum for decorative applications – basic principles factors, surface preparation</li> <li>b. Electroplating appliances and galvano accessories</li> <li>c. Various types of galvano solutions and their usages</li> <li>d. Types of cathodes and anodes for different metals</li> <li>e. Storage of Chemicals</li> <li>f. Electro polishing for removing unwanted metals from surface of</li> </ol>

		<p>jewellery.</p> <p>g. Safety and precautionary measures and pollution aspect.</p>
11	Practice of different textures and special effects	<p>Types of Enamels : opaque and transparent</p> <p>Enameling Kilns and equipments</p> <p>Cloisonné design in colour using basic techniques</p> <p>Developing design in colour using basic techniques</p> <p>Textures and special effects</p> <p>Gilding techniques, Dipping techniques.</p>
	Demonstration and practice on various types of castings.	<p>Introduction to casting Technology and the complete production cycle of casting. What is casting, definition, types of casting &amp; its importance, advantages and disadvantages of various casting procedures, casting technology – its advantages and disadvantages of various casting procedures, casting technology – its advantages and disadvantages, Investing and use of burnout furnace, karat age Control, wax weight to metal weight ratios, burnout procedures, de-waxing techniques, ins &amp; outs of trouble shooting casting problems.</p> <p>Refractory ceramic mould details, common defects in casting. The steps followed in casting investment powder, different types, mixing of investment, timing, de-waxing – stearnvs dry, burn-out of mould – changes in mould material time and temperature control – typical burnout cycles. Safety against little silica powder. Typical casting defects – causes &amp; the art of minimizing</p>
12	Familiarization with different types of stones and practice on stone settings.	<p>Definition of Gemstones, classification, grading, sources of availability, physical &amp; chemical properties. Crystal Structures,</p>

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		<p>economic valuation. Different techniques of stone setting including invisible setting.</p> <p>Synthetic (artificial) Gem stones, classification – types, characteristics Evolution of setting, Importance, stone setting tools, like gravers and burs – introduction, description and purpose. Types of cuts – step out and brilliant round cut, Theoretical aspects of invisible setting.</p>
13.	<b>Internal Assessment 03days</b>	

**NOTE:** - *More emphasis to be given on video/real-life pictures during theoretical classes. Some real-life pictures/videos of related industry operations may be shown to the trainees to give a feel of Industry and their future assignment.*



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## 9.1 EMPLOYABILITY SKILLS

(DURATION: - 110 HRS.)

<b>Block – I</b> (Duration – 55 hrs.)	
<b>1. English Literacy</b>	
Duration : 20 Hrs. <span style="float: right;">Marks : 09</span>	
Pronunciation	Accentuation (mode of pronunciation) on simple words, Diction (use of word and speech)
Functional Grammar	Transformation of sentences, Voice change, Change of tense, Spellings.
Reading	Reading and understanding simple sentences about self, work and environment
Writing	Construction of simple sentences Writing simple English
Speaking / Spoken English	Speaking with preparation on self, on family, on friends/ classmates, on know, picture reading gain confidence through role-playing and discussions on current happening job description, asking about someone's job habitual actions. Cardinal (fundamental) numbers ordinal numbers. Taking messages, passing messages on and filling in message forms Greeting and introductions office hospitality, Resumes or curriculum vita essential parts, letters of application reference to previous communication.
<b>2. I.T. Literacy</b>	
Duration : 20 Hrs. <span style="float: right;">Marks : 09</span>	
Basics of Computer	Introduction, Computer and its applications, Hardware and peripherals, Switching on-Starting and shutting down of computer.
Computer Operating System	Basics of Operating System, WINDOWS, The user interface of Windows OS, Create, Copy, Move and delete Files and Folders, Use of External memory like pen drive, CD, DVD etc, Use of Common applications.
Word processing and Worksheet	Basic operating of Word Processing, Creating, opening and closing Documents, use of shortcuts, Creating and Editing of Text, Formatting the Text, Insertion & creation of Tables. Printing document. Basics of Excel worksheet, understanding basic commands, creating simple worksheets, understanding sample worksheets, use of simple formulas and functions, Printing of simple excel sheets.
Computer Networking and Internet	Basic of computer Networks (using real life examples), Definitions of Local Area Network (LAN), Wide Area Network (WAN), Internet, Concept of Internet (Network of Networks), Meaning of World Wide Web (WWW), Web Browser, Web Site, Web page and Search Engines. Accessing the Internet using Web Browser, Downloading and Printing Web Pages, Opening an email account and use of email. Social media sites and its implication. Information Security and antivirus tools, Do's and Don'ts in Information

	<b>Security, Awareness of IT - ACT, types of cyber crimes.</b>
<b>3. Communication Skills</b>	
Duration : 15 Hrs. <span style="float: right;">Marks : 07</span>	
Introduction to Communication Skills	<p><b>Communication and its importance</b></p> <p><b>Principles of Effective communication</b></p> <p><b>Types of communication - verbal, non verbal, written, email, talking on phone.</b></p> <p><b>Non verbal communication -characteristics, components-Para-language</b></p> <p><b>Body language</b></p> <p><b>Barriers to communication and dealing with barriers.</b></p> <p><b>Handling nervousness/ discomfort.</b></p>
Listening Skills	<p><b>Listening-hearing and listening, effective listening, barriers to effective listening guidelines for effective listening.</b></p> <p><b>Triple- A Listening - Attitude, Attention &amp; Adjustment.</b></p> <p><b>Active Listening Skills.</b></p>
Motivational Training	<p><b>Characteristics Essential to Achieving Success.</b></p> <p><b>The Power of Positive Attitude.</b></p> <p><b>Self awareness</b></p> <p><b>Importance of Commitment</b></p> <p><b>Ethics and Values</b></p> <p><b>Ways to Motivate Oneself</b></p> <p><b>Personal Goal setting and Employability Planning.</b></p>
Facing Interviews	<p><b>Manners, Etiquettes, Dress code for an interview</b></p> <p><b>Do's &amp; Don'ts for an interview.</b></p>
Behavioral Skills	<p><b>Problem Solving</b></p> <p><b>Confidence Building</b></p> <p><b>Attitude</b></p>
<b>4. Entrepreneurship Skills</b>	
Duration : 15 Hrs. <span style="float: right;">Marks : 06</span>	
Concept of Entrepreneurship	<p><b>Entrepreneur - Entrepreneurship - Enterprises:-Conceptual issue</b></p> <p><b>Entrepreneurship vs. management, Entrepreneurial motivation.</b></p> <p><b>Performance &amp; Record, Role &amp; Function of entrepreneurs in relation to the enterprise &amp; relation to the economy, Source of business ideas, Entrepreneurial opportunities, The process of setting up a business.</b></p>
Project Preparation & Marketing analysis	<p><b>Qualities of a good Entrepreneur, SWOT and Risk Analysis. Concept &amp; application of PLC, Sales &amp; distribution Management. Different</b></p> <p><b>Between Small Scale &amp; Large Scale Business, Market Survey, Method of marketing, Publicity and advertisement, Marketing Mix.</b></p>
Institutions Support	<p><b>Preparation of Project. Role of Various Schemes and Institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non financing support agencies to familiarizes with the Policies /Programmes &amp; procedure &amp; the available scheme.</b></p>
Investment Procurement	<p><b>Project formation, Feasibility, Legal formalities i.e., Shop Act, Estimation &amp; Costing, Investment procedure - Loan procurement - Banking Processes.</b></p>

<b>5. Productivity</b>	
Duration : 10 Hrs. <span style="float: right;">Marks : 05</span>	
Benefits	<b>Personal / Workman - Incentive, Production linked Bonus, Improvement in living standard.</b>
Affecting Factors	<b>Skills, Working Aids, Automation, Environment, Motivation - How improves or slows down.</b>
Comparison with developed countries	<b>Comparative productivity in developed countries (viz. Germany, Japan and Australia) in selected industries e.g. Manufacturing, Steel, Mining, Construction etc. Living standards of those countries, wages.</b>
Personal Finance Management	<b>Banking processes, Handling ATM, KYC registration, safe cash handling, Personal risk and Insurance.</b>
<b>6. Occupational Safety, Health and Environment Education</b>	
Duration : 15 Hrs. <span style="float: right;">Marks : 06</span>	
Safety & Health	<b>Introduction to Occupational Safety and Health importance of safety and health at workplace.</b>
Occupational Hazards	<b>Basic Hazards, Chemical Hazards, Vibroacoustic Hazards, Mechanical Hazards, Electrical Hazards, Thermal Hazards. Occupational health, Occupational hygienic, Occupational Diseases/ Disorders &amp; its prevention.</b>
Accident & safety	<b>Basic principles for protective equipment. Accident Prevention techniques - control of accidents and safety measures.</b>
First Aid	<b>Care of injured &amp; Sick at the workplaces, First-Aid &amp; Transportation of sick person.</b>
Basic Provisions	<b>Idea of basic provision legislation of India. safety, health, welfare under legislative of India.</b>
Ecosystem	<b>Introduction to Environment. Relationship between Society and Environment, Ecosystem and Factors causing imbalance.</b>
Pollution	<b>Pollution and pollutants including liquid, gaseous, solid and hazardous waste.</b>
Energy Conservation	<b>Conservation of Energy, re-use and recycle.</b>
Global warming	<b>Global warming, climate change and Ozone layer depletion.</b>
Ground Water	<b>Hydrological cycle, ground and surface water, Conservation and Harvesting of water.</b>
Environment	<b>Right attitude towards environment, Maintenance of in -house environment.</b>
<b>7. Labour Welfare Legislation</b>	
Duration : 05 Hrs. <span style="float: right;">Marks : 03</span>	
Welfare Acts	<b>Benefits guaranteed under various acts- Factories Act, Apprenticeship Act, Employees State Insurance Act (ESI), Payment Wages Act, Employees Provident Fund Act, The Workmen's compensation Act.</b>
<b>8. Quality Tools</b>	
Duration : 10 Hrs. <span style="float: right;">Marks : 05</span>	
Quality	<b>Meaning of quality, Quality characteristic.</b>

***Jewel Smith***

Consciousness	
Quality Circles	<b>Definition, Advantage of small group activity, objectives of quality Circle, Roles and function of Quality Circles in Organization, Operation of Quality circle. Approaches to starting Quality Circles, Steps for continuation Quality Circles.</b>
Quality Management System	<b>Idea of ISO 9000 and BIS systems and its importance in maintaining qualities.</b>
House Keeping	<b>Purpose of House-keeping, Practice of good Housekeeping.</b>
Quality Tools	<b>Basic quality tools with a few examples.</b>



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## **10. DETAILS OF COMPETENCIES (ON-JOB TRAINING)**

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The **competencies/ specific outcomes** on completion of On-Job Training are detailed below: -

### **Block – I**

1. Practice and understand precautions to be followed while working in finished jobs.
2. Prepare different types of documentation as per industrial need by different methods of recording information.
3. Refining of gold and alloying conversion from 24 kt to 22kt and other varieties..
4. Recovery of gold to 999 fineness.
5. Finishing Polishing and Repairing.
6. Gold smithing and jewellery makings involving different operations.
7. Manufacturing shining Engraving and colour mina working etc.
8. Electroplating of gold, alloy, rhodium for decoration purpose.
9. Fit parts together in set order using different textures with special effects.
10. Manufacture and assemble work as per drawing (customer requirements) with well developed skills, maintaining proper procedures and responsibility for own and other's work.

***NOTE: Learning outcomes are reflection of total competencies of a trainee and assessment will be carried out as per assessment criteria***

1. Industry must ensure that above mentioned competencies are achieved by the trainees during their on job training.
2. In addition to above competencies/ outcomes industry may impart additional training relevant to the specific industry.

INFRASTRUCTURE FOR PROFESSIONAL SKILL & PROFESSIONAL KNOWLEDGE

<b>JEWEL SMITH</b>			
<b>LIST OF TOOLS AND EQUIPMENT for Basic Training (For 20 Apprentices)</b>			
<b>A. TRAINEES TOOL KIT</b>			
<b>Sl. No.</b>	<b>Name of the Tool &amp; Equipments</b>	<b>Specification</b>	<b>Quantity</b>
<b>Consumables [Per Student]</b>			
1	Regular Pencil - HB , B , 2B		As required
2	Clutch Pencil - 0.5 MM		As required
3	0.5mm lead		As required
4	Clutch Pencil - 0.3 MM		As required
5	0.3mm lead		As required
6	Rotring Pen - 0.1 MM		As required
7	Compass with clutch pencil - Mapped		As required
8	Transparent pocket files - A4		As required
9	18 bi-colour pencil set - Faber castell		As required
10	Executive bond white paper - A4		As required
11	Alabaster paper 100 Gsm - A4		As required
12	Gateway Paper - A4		As required
13	Eraser		As required
14	Sharpener for pencils		As required
15	Folder		As required
<b>Tool Kit [Per Student]</b>			
16	Set Square 30/60/90 deg - Medium		1 No.
17	Set Square 90/45/45 deg - Medium		1 No.
18	Protractor - Medium		1 No.
19	Ruler - 6" Plasic		1 No.
20	Ruler - 12" Metal		1 No.
21	Stencil - 1815		1 No.
22	Stencil - 18091		1 No.
23	Stencil - 18207		1 No.
24	Stencil - 18206		1 No.
25	Stencil - 1889		1 No.
<b>Jewellery CAD Designing using Rhinoceros</b>			
<b>Sl. No.</b>	<b>Items</b>		<b>Qty</b>
<b>Equipments[Per Student]</b>			

1	Computer with latest configuration	20 Nos.
2	Educational Lab license Software Rhinoceros	1 No.
<b>Diamond Grading</b>		
<b>Sl. No.</b>	<b>Items</b>	<b>Qty</b>
<b>Equipments[Common]</b>		
1	Carat balance	1 No.
2	Sieve size	1 No.
3	Ultra- violer Lamp	1 No.
4	Microscope	5 Nos.
5	LED Television 42"	1 No.
<b>Bench tools, Student kit to be returned by students daily</b>		
1	MM guage	1 No.
2	10x lens	1 No.
3	Locking Tweezer	1 No.
4	selvyt cloth	1 No.
5	Scoop	1 No.
6	Colour grading shade card	1 No.
7	Assortment pad	1 No.
8	Pencil	1 No.
9	0.5mm red ink pilot pen	1 No.
10	0.5mm green ink pilot pen	1 No.
11	pouch for all the items in the kit	1 No.
<b>Consumables[Per Student]</b>		
1	Worksheets for the full program	As required
2	Spiral bound Handout	As required
<b>Consumables[Common]</b>		
1	Camlin Water colors, student grade	As required
2	Medium Solder	As required
3	Lakh	As required
4	Emery Paper, 400	As required
5	Emery Paper, 600	As required
6	Emery Paper, 800	As required
7	Emery Paper, pink	As required
8	Drawing Paper, Quarter Size	As required
9	Fevicol	As required
10	Saw Blades	As required
11	Fevistick	As required
12	Flux	As required
13	Tripoli	As required
14	Rouge	As required

15	Graver With Handle	As required
<b>Rubber mould packing, vulcanizing, moulding, course wax injection and tree making</b>		
<b>Equipments [Common]</b>		
<b>Tools [Common]</b>		
1	Wax Welder	3 Nos.
2	Aluminium Frames	8 Nos.
3	Wax Spatulas	2 Sets
4	Blade Handle	5 Nos.
5	Clamping Device	5 Nos.
6	Acrylic Plates	10 Nos.
7	Investment Flask	6 Nos.
8	Wax Carving Tool Set	2 Sets
9	Acrylic Stand	5 Nos.
<b>Consumables[Per Student]</b>		
1	Rubber Sheets [Castaldo]	As required
2	Wax for Injection [Common]	As required
3	Silicon Spray	As required
4	Surgical Blade No. 11	As required
5	Surgical Blade No. 12	As required
6	Rubber Base [Common]	As required
7	Benzene [Common]	As required
8	Talcum Powder [ Common]	As required
9	Cotton [Common]	As required
<b>Casting</b>		
<b>Sl. No.</b>	<b>Items</b>	<b>Qty</b>
<b>Equipments [Common]</b>		
<b>Tools [Common]</b>		
1	Wax Welder	5 Nos.
2	Aluminium Frames	8 Nos.
3	Wax Spatulas	2 Sets
4	Blade Handle	5 Nos.
5	Clamping Device	5 Nos.
6	Acrylic Plates	5 Nos.
7	Investment Flask	6 Nos.
8	Wax Carving Tool Set	2 Sets
9	Tongs for Holding Flask and Crucible	2 Nos.
10	Adapter Plates	2 Nos.
11	Plastic Bucket	1 No.
12	Measuring Cylinder	1 No.
13	Rubber Bowls	2 Nos.

14	Blender		1 No.
15	Acrylic Sand		5 Nos.
<b>Consumables[Per Student]</b>			
1	Rubber Sheets [Castaldo]		As required
2	Wax for Injection [Common]		As required
3	Silicon Spray [Common]		As required
4	Surgical Blade No. 11		As required
5	Surgical Blade No. 12		As required
6	Rubber Base [Common]		As required
7	Benzene [Common]		As required
8	Talcum Powder [Common]		As required
9	Cotton [Common]		As required
10	Rubber Gloves [Common]		As required
11	Silicon Ring		As required
12	Boric Acid Powder [Common]		As required
13	Graphite rod for Stirring [Common]		As required
14	Investment Powder [Common]		As required
15	Dust Mask		As required
16	Plastic Gloves [Common]		As required
17	Masking Tape [Common]		As required
<b>Basic Stone Setting</b>			
<b>Sl. No.</b>	<b>Items</b>		<b>Qty</b>
<b>Equipments &amp; Tools [Per Student]</b>			
1	Grinder [Common]		1 No.
2	Bench Block		1 No.
3	Ring Clamp With Screw		1 No.
4	Ring Clamp With Wedge		1 No.
5	Steel Square		1 No.
6	Center Punch		1 No.
7	Scriber		1 No.
8	Trinangle. Round, Flat Files [2- cut]		1 each
9	Chisel Hammer		1 No.
10	Little Torch kit with Accessories		1 No.
11	Flexible shaft with key		1 No.
13	Table Lamp		1 No.
14	Optivisor		1 No.
15	Tweezer - Straight		1 No.
16	File Cleaning Brush		1 No.
17	Eye glass		1 No.
18	Saw Frame		1 No.

19	Chain nose Piler		1 No.
20	Shellac stick		1 No.
21	Shellac stick Holder		1 No.
22	Polishing stone- Red, Green, Pink		1 each
23	Compressor Hammer		1 No.
24	Micro Flexible Shaft		1 No.
25	Degree Guage		1 No.
<b>Cosumables [Per Student]</b>			
1	Knife Graver		As required
2	Flat Graver		As required
3	Round Graver		As required
4	Double Half round Graver		As required
5	Ball burrs of different sizes		As required
6	Heart burr of different sizes		As required
7	Cup burrs of different sizes		As required
8	Beading tools of different sizes		As required
9	Cross burrs		As required
10	Silver casting pieces		As required
11	Lighter		As required
12	Bees Wax		As required
13	Lakh		As required
14	Black Wax		As required
15	Tooth Brush		As required
16	Powder [Common]		As required
17	Stones of different Sizes		As required
18	Handkerchief		As required
19	Suppari		As required
20	Blue wire, 4mm		As required
<b>Enameling</b>			
<b>Sl. No.</b>	<b>Items</b>		<b>Qty</b>
<b>Equipments &amp; Tools [Per Student]</b>			
1	Enamelling Furnace		1 No.
2	Containers		1 Dozen
3	Steel Pallets		15 Nos.
4	Brass wire Brush		1 No.
5	Plastic Trays		1 No.
6	Feeder		1 No.
7	Stainless Steel mesh		2 Nos.
8	Stainless Steel Morter pastel		1 No.
9	Sieves		2 Nos.
10	Scissor		5 Nos.

<b>Consumables[Per Student]</b>			
1	COPPER SHEET 20 guage		As required
2	Enamel colours assorted 10 Shades		As required
3	Enamel colours assorted 10 Shades		As required
4	sable drawing brush, [0,1,3 each]		As required
5	Emwry Sticks		As required
6	Silver		As required
7	Sulphuric Acid		As required
Sl. No.	Items		Qty
<b>Equipments [Common]</b>			
1	Ring Mandrel		4 Nos.
2	Polishing Machine with Dust collector		4 Nos.
3	Ultrasonic Cleaner		2 Nos.
4	Steam Cleaner		2 Nos.
Sl. No.	Items		Qty
<b>Equipments [Common]</b>			
1	Ring Mandrel		4 Nos.
2	Polishing Machine with Dust collector		4 Nos.
3	Ultrasonic Cleaner		2 Nos.
4	Steam Cleaner		2 Nos.
<b>Tools[Per Student]</b>			
1	Drawing Board [ Quarter imperial]		1 No.
2	Lakh Stick		1 No.
3	Triangle file, 6"		1 No.
4	Half Round file, 6"		1 No.
5	Saw Frame		1 No.
6	Set Square 30-60		1 No.
7	Set Square 45		1 No.
8	Divider		1 No.
9	Scale		1 No.
10	Protector		1 No.
11	T- Square, Small		1 No.
12	Tweezer Plain		1 No.
13	Soldering Board		1 No.
14	Flux Dish		1 No.
15	Table Lamp		1 No.
16	Bench Peg		1 No.
17	Work Batch		1 No.

18	Camlin Water colors, student grade		5 sets
19	Medium Solder		2 Nos.
20	Lakh		100 Gms
21	Emery Paper, 400		2 Nos.
22	Emery Paper, 600		2 Nos.
23	Emery Paper, 800		2 Nos.
24	Emery Paper, pink		2 Nos.
25	Drawing Paper, Quarter Size		50 Nos.
26	Fevicol		250 Gms
27	Saw Blades		1 Packet
28	Fevistick		3 Nos.
29	Flux		100 Gms
30	Tripoli		1/4
31	Rouge		1/4
32	Graver With Handle		1 No.



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**JEWEL SMITH**

B : GENERAL MACHINERY INSTALLATIONS:-			
List of Machinery for JEWEL SMITH			
Casting Lab			
Sr. No.	Particulars of Asset with Function of Machine	y	Purpose
1	Vulcanizer	1	Rubber Mold Making Machine
2	Vacuum Pressure Casting Machine	1	Investment Casting for Jewellery
3	Burnout Furnace	1	Investment Casting Process
4	Melting Furnace		Melting of Gold or Silver
5	Wax Injector	1	making Wax Masters from Rubber Moulds
6	De - Waxing Machine	1	De - Waxing Process for Investment Casting
7	Vibrator Machine	1	Finishing pics with Stainless Steel Balls
8	Heavy duty Vacuum Machine	1	Vacuum in Investment Casting Process
9	Water Jet Machine with stand	1	Casting Process
10	Programmable Temperature Controller	1	Process
11	Steam Cleaning Machine with foot peddle	1	Casting Process
12	Sand Blaster Machine	1	Special treatment Finishing of Product
13	Ultrasonic cleaner Machine	1	Cleaning and finishing of jewellery pieces after aniline and Casting
Jewellery Lab			
Sr. No.	Particulars of Asset with Function of Machine	y	Purpose
14	Pen Plating Unit	1	Plating of Small parts with special effects
15	Buffing Machine Two Side	3	Mirror finis to Jewellery Pieces
16	Double side dust collector with heavy motor	1	Collect All dust and material in the workshop
17	Split Lapping Machine with wooden table	1	finis to Jewellery Pieces
18	Pneumatic Hammer with heavy duty airflow and h	1	pieces
19	Pneumatic Sprue cutter with stand and foot padd	1	Cutting Sprue of pieces after investment Casing
20	Belt Grinding Machine for two person	1	finish jewellery pieces as filling process
21	Hydro Welder Machine	6	techniques
22	Flexible shaft Motors	20	jewellery pieces
Material Study Lab			
23	Flexible shaft Grinding Machine	2	Mirror finis to Jewellery Pieces
24	Milling & Drilling Machine	1	foundation programme
25	Lathe Machine	1	foundation programme
26	Fret Jig Saw Machine	1	and Metal
27	Bench Grinding Machine	1	sharpening of tools
28	12" Hand Shearing Machine with double side bla	1	making
29	Strip cutting Machine	1	Cutting different size strip for jewellery making
30	Six pass wire drawing machine	1	making six diffrent sizes wires in one operation
31	Wire and sheet rolling machine	1	this machine used for rolling thin the metal sheet
32	Tube forming Machine	1	making tubes from strips for bangle making
33	Universal faceting and Milling Machine	1	bangle making
34	Hydraulic Press	1	using for die cutting and stemping techniques
35	Chain Making Machine	1	using and demonstrate for box chain making
Polishing and Plating Lab			
36	Plating)	1	Use for Plating on the Jewellery Pieces
37	Air Compressor	1	use for generating air for different machines
38	Bangle & Ring sizing Machine with dies	1	used for sizing of Bangles and Rings
39	Stamping Machine -Manual Operation	1	Portable stamping for jewellery pieces
40	Magnetic finishing Machine with 0.3mm&0.5mm magnetic pins	2	Finishing and Polishing with magnatic pins
41	Turning machine for ring and bangles	1	Rings
42	Striping Machine	1	finishing on gold pieces
43	Picking unit for finishing	1	Casting
44	Ultrasonic cleaner Machine	1	aniline and Casting
45	Chain Soldering Machine	1	used to Solduring mahine chains
46	Granulating (Dulling) Machine	1	making different texture and suface techniques
47	Electro forming unit	1	this machine used for making hallow jewellery
48	Grooved Roller Pair	10	used for different surface techniques for rings
49	Desian Rolling Machine with Qty. 5 Desian Rollers	1	used for different surface techniques

Note: In case of basic training setup by the industry the tools, equipment and machinery available in the industry may also be used for imparting basic training.



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FORMAT FOR INTERNAL ASSESSMENT

Name & Address of the Assessor :						Year of Enrollment :								
Name & Address of ITI (Govt./Pvt.) :						Date of Assessment :								
Name & Address of the Industry :						Assessment location: Industry / ITI								
Trade Name :			Semester:			Duration of the Trade/course:								
Learning Outcome:														
Sl. No	Maximum Marks (Total 100 Marks)		15	5	10	5	10	10	5	10	15	15	Total internal assessment Marks	Result (Y/N)
	Candidate Name	Father's/Mother's Name	Safety consciousness	Workplace hygiene	Attendance/ Punctuality	Ability to follow Manuals/ Written instructions	Application of Knowledge	Skills to handle tools & equipment	Economical use of materials	Speed in doing work	Quality in workmanship	VIVA		
1														
2														