**Swatirtha Charitable Trust**

**BIHAR SKILL DEVELOPMENT MISSION – 2018-19**

**300 hr. PROGRAM**

It’s Objective, learning outcomes, Modules, assessments and material list

**CERTIFICATE PROGRAM IN WELDING TECHNICIAN**

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| Submitted to **:-**  **Bihar Skill Development Mission,**  5th floor, ‘A’ Wing, Niyojan Bhawan  Near Income Tax Office,  Patna-800 001 | Submitted By **:- Swatirtha Charitable Trust,**  Vill-Chandipur, PO-Abhirampur, PS-Asgram, Dist-Purba Bardhaman, West Bengal-713144 |
| Session – 2018-19 |

**Certificate Course in Welding Technician**

* Course Id-SWATIRTHA- Welding Technician
* Candidate Eligibility : **10TH Passed**
* Course Duration: 300 Hr

**CONTACT DETAILS OF THE BODY SUBMITTING THE QUALIFICATION FILE**

**Name and address of submitting body:**

**Swatirtha Charitable Trust**

**Address:**

Vill-Chandipur, PO-Abhirampur, PS-Ausgram,

Dist-Purba Bardhaman, West Bengal-713144

**Name and contact details of individual dealing with the submission**

**Name :** Rumpa Malik

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**List of documents submitted in support of the Qualifications File**

1. Curriculum Document

**SUMMARY**

|  |  |
| --- | --- |
| **Qualification Title** | **Certificate in Welding Technician** |
| **Qualification Code** | **SWATIRTHA-Welding Technician** |
| **Nature and purpose of the qualification** | **Nature**  300 Hrs Certificate Course in Welding Technician  **Purpose**  Explain the basic elements, features about various types of welding used in Industries**.**  . |
| **Body/bodies which will award the qualification** | **Swatirtha Charitable Trust** |
| **Occupation(s) to which the qualification gives access** | **SWATIRTHA-Welding Technician** |
| **Entry requirements and / or recommendations** | **10th PASSED** |

1. **OBJECTIVE OF THE COURSE: -**

This module comprises of basic as well as advance knowledge about Safety & different types of welding used in various industries.

It attempts to introduce the fundamentals concepts of Arc Welding, Gas Welding, TIG Welding, MIG Welding etc.

Further this course attempts to introduce the fundamental concepts of defects found during welding and also about their remedies.

At the next level of the course the student will be introduce to the fundamental concepts of carrying out robotic welding.

At the final stage the student shall be able to do different types of Welding of High grade.

1. **LEARNING OUTCOMES :-**
2. Understand the job requirement and the equipment to be used.
3. Understand the work output required from the process.
4. Select the type of electrode and the filler material for the welding process.
5. Understand selection of various parameters like welding current, voltage, electrode distance and similar items.
6. To install the welding work pieces on the apparatus.
7. Check the operations of the machine and conduct the actual welding process.
8. Check the measurement instruments for monitoring the welding process, parameters.
9. Understand unloading the finished good using suitable equipment like (hoist, lift, etc.) Ensure there is no damage to the lifted work piece.
10. To keep a record of the finished goods.
11. Perform complete visual and dimension check as per product drawing
12. Document the observations in the inspection check sheet.
13. Handle inspection equipment and instruments like vernier, micrometer and height gauge.
14. Create and sustain a safe & clean environment.
15. Identify activities which can cause potential injury, through sharp objects, gas leakage, burns, fumes, etc.
16. **MODULE- 300 Hrs (CERTIFICATE PROGRAM IN WELDING TECHNICIAN)**

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| --- | --- | --- | --- | --- | --- |
| **DURATION :- 300 Hrs**  **CERTFICATE PROGRAM IN WELDING TECHNICIAN** | | | | | |
| **MODULE CODE & NAMES** | | **Code :- WELDING TECHNICIAN**  **Module :-** WELDING TECHNICIAN | | | |
| **RATIONALE & OBJECTIVE OF THE MODULES** | | This module enables trainers to understand the fundamental concepts of different types of welding used in various industries, also It attempts to introduce the fundamentals concepts of Arc Welding, Gas Welding, TIG Welding, MIG Welding etc. Further this course attempts to introduce the fundamental concepts of defects found during welding and also about their remedies. | | | |
| **MODULE COMPETENCE** | | At the final stage the student shall be able to do different types of Welding of High grade. | | | |
| **MODE OF DELIVERY** | | Practical and theoretical | | | |
|  | | | | | |
| **Sl. No** | **ELEMENTS/TOPICS** | | | **PERIOD** | **Hours** |
|  | | | | | |
| **1** | **INTRODUCTION** | | | 5 Hours | |
|  |  | | 1.1 General Discipline in the class room |
|  |  | | 1.2 General Safety Rules |  |  |
|  |  | | 1.3 Introduction to Automotive Industry |  |  |
|  |  | | 1.4 Familiarization about various auto manufacturers |  |  |
|  |  | | 1.5 Familiarization of terms associated with the sector |  |  |
|  |  | | 1.5 Brief outline about the course |  |  |
|  |  | | 1.6 Job Opportunities for a welding and quality technician |  |  |
|  |  | | 1.7 Career growth path for a welding and quality technician |  |  |
|  |  | |  |  |  |
| **2** | **UNDERSTAND WELDING JOB REQUIREMENTS AND RELATED PROCESSES** | | |  |  |
|  |  | | 2.1 Understand the engineering drawing, sketches and work order | 25 Hours | |
|  |  | | 2.2 Understand what process and equipment will be used to deliver required output. |
|  |  | | 2.3 Understand the does and don’ts of the manufacturing process as defined in SOP/work instruction or defined by supervisors |  |  |
|  |  | | 2.4 Understand impact of various physical parameters like temperature, pressure, electrode distance on the properties of final output product like durability, ductility & surface feel etc. |  |  |
|  |  | |  |  |  |
| **3** | **PREPARE THE WELDING MACHINE FOR THE WELDING PROCESS** | | |  |  |
|  |  | | 3.1 Understand the right welding methodology and process to be adopted for completing the work order from the supervisor. | 35 Hours | |
|  |  | | 3.2 Understand the various welding parameter like electrode type, electrode distance (gaps) welding current, voltage, process time before starting welding process |
|  |  | | 3.3 Understand the material required and the equipment availability for executing the activity. |  |  |
|  |  | | 3.4 Understand the type of electrode in terms of electrode material & thickness, filler material and flux which will be required for the selected welding process before start of welding. |  |  |
|  |  | | 3.5 Understand setting up welding apparatus as per the selected welding process & SOP and the setting standards of machine. |  |  |
|  |  | | 3.6 Remove any extra material, sharp edges which might impact the final welded product |  |  |
|  |  | |  |  |  |
| **4** | **SUPPORT THE WELDER IN THE WELDING PROCESS** | | |  |  |
|  |  | | 4.1 Install the work pieces on the welding apparatus keeping in mind the electrode distance, contact area, pressure, temperature, application as per welding SOP/control plan | 35 Hours | |
|  |  | | 4.2 Check the operation of core welding equipment like welding gun, transformers, gas discharge units as per set up documentation |
|  |  | | 4.3 Support the operator in conducting destructive and nondestructive test. |  |  |
|  |  | | 4.4 Help welder in monitoring process parameters like gas discharge flow, electrode force, and electrode distance by reading various meters to prevent any harm on work pieces. |  |  |
|  |  | | 4.5 Measure final welding pieces & compare the dimension as given in the work order engineering drawing |  |  |
|  |  | | 4.6 In case part is not as per drawing, remove extra material by using chippers, grinders, etc. |  |  |
| **5** | **REMOVE THE FINISHED GOODS AND STORE THEM IN THE DESIGNATED PLACE** | | | 30 Hours | |
|  |  | | 5.1 Understand the output product shape and decide the suitable mechanism to lift the output |
|  |  | | 5.2 Clamp the product and lift the output using suitable equipment like hoist, life, trolley |  |  |
|  |  | | 5.3 Ensure there is no damage to the lifted work piece |  |  |
|  |  | | 5.4 Identify by tag the right quality pieces. |  |  |
|  |  | |  |  |  |
| **6** | **CONDUCT QUALITY CHECKS AND INSPECTION OF THE FINISHED METAL CAST PRODUCTS** | | |  |  |
|  |  | | 6.1 Measure the specifications of the finished product using devices like micrometers, vernier calipers, gauges, rulers, weighing scales and any other inspection equipment and compare with the parameters given in the work order | 35 Hours | |
|  |  | | 6.2 Compare texture, color, surface properties, hardness and strength with the given product specifications |
|  |  | | 6.3 Note down the observations of the basic inspection process and identify pieces which are OK and also not meeting the specified standards |  |  |
|  |  | | 6.4 Separate the defective pieces into two categories – pieces which can be repaired/ modified and pieces which are beyond repair |  |  |
|  |  | | 6.5 Discard the pieces which are beyond repair and repair the ones which need minor modifications/ rework |  |  |
|  |  | | 6.6 Maintain records of each category of work outputs |  |  |
|  |  | | 6.7 Rectify minor defects like excess slag, shape deformation, sharp edges, rough surfaces, grooves, holes etc. by Fettling, chipping, Cutting, sawing, filling, shearing, hammering etc. |  |  |
|  |  | | 6.8 Escalate all issues related to change in color, surface properties, hardness etc. so that the manufacturing equipment can be reset to achieve the specified output |  |  |
| **7** | **INSPECT AND MAINTAIN THE PRODUCT QUALITY** | | |  |  |
|  |  | | 7.1 Conduct an inspection of a part covering the following check points | 35 Hours | |
|  |  | | 7.2 ·Visual inspection of the part for scratches, dents, damages, packing as per the norm set |
|  |  | | 7.3 Conduct complete dimensional/layout inspection as per drawing |  |  |
|  |  | | 7.4 Note down the observations of basic inspection process and identify ok & not meeting specification parts Separate the defective parts into two categories |  |  |
|  |  | | 7.5 Parts which can be repaired / modified and pieces which are beyond repair. |  |  |
|  |  | | 7.6 Discard the pieces which are beyond repair and repair the pcs with minor defects, maintain record of each category. |  |  |
|  |  | | 7.7 Coordination with the respective process owners/seniors in QA and implement CAPA for discrepancies in the parameters identified in the report on immediate basis. |  |  |
|  |  | | 7.8 Participate in checking effectiveness of implementation and report the process till the discrepancies are resolved. |  |  |
|  |  | | 7.9 Document the observation of the inspection & maintain records |  |  |
| **8** | **CONDUCT REGULAR CLEANING AND MAINTENANCE OF THE EQUIPMENT** | | |  |  |
|  |  | | 8.1 Arrange all equipment in a proper order as indicated in the equipment manual | 30 Hours | |
|  |  | | 8.2 Store equipment auxiliaries and spare parts in proper designated areas |
|  |  | | 8.3 tag process related equipment parts/ spare parts as per part number or serial number so that sorting of equipment becomes easy |  |  |
|  |  | | 8.4 Check the working of all bearing, rollers, shafts etc. and oil all moving parts of the equipment on a periodic basis |  |  |
|  |  | | 8.5 Check the working of non-moving parts and periodically conduct preventive maintenance to prevent machine failure |  |  |
|  |  | | 8.6 Periodically check the equipment calibration and report any errors to the maintenance teams for rectification |  |  |
|  |  | | 8.7 Prepare periodic log sheets of equipment maintenance dates, maintenance schedules and maintenance activity conducted on the equipment |  |  |
| **9** | **MAINTAIN A SAFE AND HEALTHY WORKING ENVIRONMENT** | | |  |  |
|  |  | | 9.1 Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals ,loud noise | 25 Hours | |
|  |  | | 9.2 Create awareness amongst other by sharing information on the identified risks |
|  |  | | 9.3 Operate the machine using the recommended Personal Protective Equipment (PPE) |  |  |
|  |  | | 9.4 Maintain a clean and safe working environment near the work place and ensure there is no spillage of chemicals, production waste, oil, solvents etc |  |  |
|  |  | | 9.5 Maintain high standards of personal hygiene at the work place |  |  |
|  |  | | 9.6 Ensure that the waste disposal is done in the designated area and manner as per organization SOP. |  |  |
| **10** | **MAINTAIN 5S AT THE WORK PREMISES** | | |  |  |
|  |  | | 10.1 Follow the sorting process and check that the tools, fixtures & jigs that are lying on workstations are the ones in use and unnecessary items are not cluttering the work benches or work surfaces. | 30 Hours | |
|  |  | | 10.2 Ensure segregation of waste in hazardous/ non Hazardous waste as per the sorting work instructions |
|  |  | | 10.3 Segregate the items which are labeled as red tag items for the process area and keep them in the correct places |  |  |
|  |  | | 10.4 Properly stack the various types of boxes and containers as per the size/ utility to avoid any fall of items/ breakage and also enable easy sorting when required |  |  |
|  |  | | 10.5 Make sure that all material and tools are stored in the designated places and in the manner indicated in the 5S instructions |  |  |
|  |  | | 10.6 Ensure that the area has floors swept, machinery clean and generally clean. In case of cleaning, ensure that proper displays are maintained on the floor which indicate potential safety hazards |  |  |
|  |  | | 10.7 Ensure self-cleanliness - clean uniform, clean shoes, clean gloves, clean helmets, personal hygiene |  |  |
|  |  | | 10.8 Participate actively in employee work groups on 5S and encourage team members for active participation |  |  |
| **11** | **SOFT SKILLS** | | |  |  |
|  |  | | 11.1 Identifying Soft skills | 15 Hours | |
|  |  | | 11.2 By identifying oneself, arriving at a decision about oneself |
|  |  | | 11.3 Develop Creativity Skills |  |  |
|  |  | | 11.4 Problem Management |  |  |
|  |  | | 11.5 Introducing the Leader and Followers |  |  |
|  |  | | 11.6 Team Building and Teamwork |  |  |
|  |  | | 11.7 Communications |  |  |

1. **ASSESSMENT / EXAMINATION**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **1** | **BASIC/INTERNAL ASSESSMENT** | ( Mid of the stage) | **P/T** | **MARKS** |
|  |  | 1. Prepare project on Different types of Welding. | T |  |
|  |  | 1. Internal assessment test on Welding Safety, Welding Type, Properties etc | P |  |
| **2** | **FINAL PROJECT PRESENTATION** | ( Final stage of completion of session) |  |  |
|  |  | 1. Display & Submission – Safety & Precaution during Welding | T |  |
|  |  | 1. Display & Submission – Engineering Drawing. | T |  |
|  |  | 1. Display & Submission – Different types of Defects during Welding & their remedies. | P |  |
|  |  | 1. Display & Submission – Properties of Different Types of Welding and their applications | P |  |
|  |  | 1. Final test on given job to be done by Different joints of Welding. | P |  |