**Swatirtha Charitable Trust**

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

**390 Hr. PROGRAM**

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

**CERTIFICATE PROGRAM IN BASIC FITTER**

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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 Basic Fitter**

* Course Id- SWATIRTHA-Basic Fitter
* Candidate Eligibility : **10TH Passed**
* Course Duration: 390 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

**Position in the organization** : President

**Tel number(s) :** +91-9650744468

**Website** : www.swatirtha.org

**E-mail address :** rumpamalik44@gmail.com

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

1. Curriculum Document

**SUMMARY**

|  |  |
| --- | --- |
| **Qualification Title** | **Certificate in Basic Fitter** |
| **Qualification Code** | **SWATIRTHA-Basic Fitter** |
| **Nature and purpose of the qualification** | **Nature**  390 Hrs Certificate Course in Basic Fitter  **Purpose**  Explain the basic elements, features about Fittings & Joints of various mechanical equipments used in various Industries**.**  . |
| **Body/bodies which will award the qualification** | **Swatirtha Charitable Trust** |
| **Occupation(s) to which the qualification gives access** | **SWATIRTHA-Basic Fitter** |
| **Entry requirements and / or recommendations** | **10th PASSED** |

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

This module comprises of basic knowledge about the Fitting jobs which mainly used in Automotive sectors , like Automobile manufacturing companies, .

It attempts to introduce the fundamentals concepts of Lathe, and its applications like Woodturning, Metalworking, Metal Spinning, Acrylic Spinning, Thermal Spraying etc.

Further this course attempts to introduce the fundamental concepts of Limit fit & Tolerance, Gauges & its application in Industries.

At the next level of the course the student will be introduce to the fundamental concepts of carrying out some advance technologies which are now introduced in various manufacturing companies.

At the final stage the student shall be able to do all the fitting related jobs with safety & Quality Products.

1. **LEARNING OUTCOMES :-**
2. Introduction to safety equipments and their uses.
3. Filing practice: Filing Channel, Surface filing..
4. Marking of straight and parallel lines with odd leg calipers and steel rule ation
5. Marking straight lines and arcs using scribing block and dividers & punching Saw.
6. File steps and finish with smooth file with an accuracy of ± 0.25 mm.
7. Marking of straight lines, circles, profiles and various geometrical shapes and cutting the sheets with snips.
8. Marking according to simple blue prints for locating position of holes, scribing lines.
9. Make & assemble simple job by different basic fitting operations.
10. Drill through & blind holes.
11. Drill holes at an angle using swivel table of drilling machine.
12. Cutting threads using dies.
13. True job on four jaw chuck using knife tool.
14. Face both the ends for holding between centers.
15. Measure the diameter using outside caliper and steel rule.
16. Holding job in three jaw chuck- deburr, chamfer- corner, round ends.
17. Bore holes –spot face, pilot drill, enlarge hole using boring tools
18. Cutting & Threading of pipe
19. Flaring of pipes and pipe joints.
20. Fitting of pipes as per sketch.
21. Welding - Striking and maintaining arc, laying Straight-line beads by Manual Metal Arc welding.
22. Setting up of Oxy-acetylene flames and making fusion runs with and without filler rod.
23. Practice to make straight beads and “T‟ joint by Gas and Arc welding.
24. Making square butt joint on MS by brazing.
25. Make straight cutting by Gas
26. **MODULE- 390 Hrs (CERTIFICATE PROGRAM IN BASIC FITTER)**

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| **DURATION :- 390 Hrs**  **CERTFICATE PROGRAM IN BASIC FITTER** | | | | | |
| **MODULE CODE & NAMES** | | **Code :- BASIC FITTER**  **Module :-** BASIC FITTER | | | |
| **RATIONALE & OBJECTIVE OF THE MODULES** | | This module enables trainers to understand the fundamental concepts of Fitting jobs which mainly used in Automotive sectors , like Automobile manufacturing companies, It also attempts to introduce the fundamentals concepts of Lathe, and its applications like Woodturning, Metalworking, Metal Spinning, Acrylic Spinning, Thermal Spraying etc. | | | |
| **MODULE COMPETENCE** | | At the final stage the student shall be able to do all the fitting related jobs with safety & Quality Products. | | | |
| **MODE OF DELIVERY** | | Practical and theoretical | | | |
|  | | | | | |
| **Sl. No** | **ELEMENTS/TOPICS** | | | **PERIOD** | **Hours** |
|  | | | | | |
| **1** | **IMPORTANCE OF TRADE TRAINING** | | | 34 Hours | |
|  |  | | 1.1 Introduction to safety equipments and their uses |
|  |  | | 1.2 Introduction of first aid, operation of Electrical mains |  |  |
|  |  | | 1.3 Basic injury prevention, Basic first aid, |  |  |
|  |  | | 1.4 Hazard identification and avoidance, safety signs for Danger, Warning, caution & personal safety message |  |  |
|  |  | | 1.5 Preventive measures for electrical accidents & steps to be taken in such accidents |  |  |
|  |  | | 1.5 Health, Safety and Environment guidelines |  |  |
|  |  | | 1.6 Disposal procedure of waste materials like cotton waste, metal chips/burrs etc. |  |  |
|  |  | | 1.7 Personal protective Equipments(PPE) |  |  |
|  |  | | 1.8 Use of Fire extinguishers |  |  |
|  |  | | 1.9 Identification of tools & equipments as per desired specifications for marking & sawing |  |  |
|  |  | | 2.0 Selection of material as per application |  |  |
|  |  | | 2.1 Marking out lines, gripping suitably in vice jaws, hacksawing to given dimensions, sawing different types of metals of different sections. |  |  |
| **2** | **MEASURING INSTRUMENTS** | | |  |  |
|  |  | | 2.1 Marking of straight and parallel lines with odd leg calipers and steel rule | 34 Hours | |
|  |  | | 2.2 marking practice with dividers, odd leg calipers and steel rule (circles, arcs, parallel lines). |
|  |  | | 2.3 Marking straight lines and arcs using scribing block and dividers & punching Saw along a straight line, curved line, on different sections of metal. |  |  |
|  |  | | 2.4 File and saw on M.S. Square and pipe |  |  |
|  |  | | 2.5 Straight saw on thick section, M.S. angle and pipes |  |  |
|  |  | | 2.6 Filing flat, square, and parallel to an accuracy of 0.5mm. |  |  |
|  |  | |  |  |  |
| **3** | **MEASUREMENTS** | | |  |  |
|  |  | | 3.1 Vernier calipers, graduations, reading, use and care. | 46 Hours | |
|  |  | | 3.2 Micrometer- outside and inside –parts graduation, leading, use and care. Description of Digital micrometer. |
|  |  | | 3.3 Vernier height gauge : material construction, parts, graduations (English & Metric) uses, care and maintenance, |  |  |
|  |  | | 3.4 Vernier micrometer, parts, graduation, use, care and maintenance |  |  |
|  |  | | 3.5 Screw thread micrometer: graduation and use. |  |  |
|  |  | | 3.6 Dial test indicator, parts, graduation, Method of use,. Care and maintenance. Digital dial indicator |  |  |
|  |  | | 3.7 Vernier bevel protractor, graduations, reading, use and care, Description of dial Vernier Caliper & Digital vernier caliper |  |  |
|  |  | | 3.8 Inside micrometer: parts, graduations ,LC, reading , uses, care and maintenance, |  |  |
|  |  | | 3.9 Depth Micrometer : parts, graduations ,LC, reading , uses, care and maintenance |  |  |
|  |  | |  |  |  |
| **4** | **MAKING OF DIFFERENT TYPES OF SHAPES & STRUCTURE** | | |  |  |
|  |  | | 4.1 Safety precautions to be observed in a sheet metal workshop, sheets and sizes, Commercial sizes and various types of metal sheets, coated sheets and their uses as per BIS specifications | 46 Hours | |
|  |  | | 4.2 Marking and measuring tools, wing compass, Prick punch, snips, types and uses |
|  |  | | 4.3 Various types of sheet metal joints, their selection and applications, tolerance for various joints, their selection & application. |  |  |
|  |  | | 4.4 Wired edges – Types, sizes, and selection for various works. Riveting tools, dolly & snaps description and uses. |  |  |
|  |  | | 4.5 Method of riveting. Shearing machine- description, parts and uses. |  |  |
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| **5** | **DETAILS ABOUT CUTTING TOOLS & DRILL** | | | 44 Hours | |
|  |  | | 5.1 Chisels- materials, types, cutting angles |
|  |  | | 5.2 Power Saw, band saw, Circular saw machines used for metal sections cutting |  |  |
|  |  | | 5.3 Drill- material, types, parts and sizes (fraction, metric, number, letter drill). |  |  |
|  |  | | 5.4 Drill angle-cutting angle for different materials, cutting speed feed for different materials. |  |  |
|  |  | | 5.5 Drill holding devices- their uses. |  |  |
|  |  | | 5.6 Counter sink, counter bore and spot facing- tools and nomenclature. |  |  |
|  |  | | 5.7 Determining hole size. |  |  |
|  |  | | 5.8 Drilling machine: Sensitive (bench type, pillar type) upright, radial, gang and multi spindle drilling machine. |  |  |
|  |  | | 5.9 Drill troubles: causes and remedy. Equality of lips, correct clearance angle & grinding of drill |  |  |
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| **6** | **PROPERTIES OF MATERIAL** | | |  |  |
|  |  | | 6.1 Physical properties of engineering material: colour, weight, structure, and conductivity, magnetic properties, fusibility, specific gravity. | 26 Hours | |
|  |  | | 6.2 Mechanical properties: ductility, malleability hardness, brittleness, toughness, tenacity, and elasticity. |
|  |  | | 6.3 Cast Iron: types, properties and uses. |  |  |
|  |  | | 6.4 Wrought iron- : properties and uses. |  |  |
|  |  | | 6.5 Steel: types, properties and uses. |  |  |
|  |  | | 6.6 Composition of ferrous alloy like HSS, stainless steel etc. |  |  |
|  |  | | 6.7 Non-ferrous metals (copper, aluminum, tin, lead, zinc) properties and uses. |  |  |
|  |  | | 6.8 Aluminium and its alloys. Uses, advantages and limitation. |  |  |
| **7** | **BRITISH STANDARD AND METRIC /BIS.** | | |  |  |
|  |  | | 7.1 Description of tap, material, types and using method of hand tap. | 26 Hours | |
|  |  | | 7.2 Determination of tap drill size. |
|  |  | | 7.3 Tap wrench: types and their uses. |  |  |
|  |  | | 7.4 Removal of broken tap, studs (tap stud extractor). |  |  |
|  |  | | 7.5 Dies: British standard, metric and BIS standard, material, parts, types |  |  |
|  |  | | 7.6 Grinding wheel: Types & Specification (Abrasive type, grit size, grade, structures & bond) use, mounting and dressing. |  |  |
| **8** | **LATHE** | | |  |  |
|  |  | | 8.1 Safety precautions to be observed while working on a lathe. | 48 Hours | |
|  |  | | 8.2 Main parts of Lathe - bed, head stock, carriage, tail stock. |
|  |  | | 8.3 Cutting tools- Brief study of the nomenclature of Lathe cutting tools and necessity of correct grinding. |  |  |
|  |  | | 8.4 Solid, tipped and throw away type tools. |  |  |
|  |  | | 8.5 Cutting speed and feed and depth of cut. |  |  |
|  |  | | 8.6 Comparison for H.S.S. and carbide tools. |  |  |
|  |  | | 8.7 Use of coolants and lubricants. |  |  |
|  |  | | 8.8 Chucks – Three jaw, four-jaw, self centering and independent chucks and application. |  |  |
| **9** | **KNURLING & TAPPER** | | |  |  |
|  |  | | 9.1 Knurling: - tools description, grade, uses, speed and feed, coolant for knurling. | 28 Hours | |
|  |  | | 9.2 Taper – definition, use and method of expressing tapers. Standard tapers calculations of Morse taper. |
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| **10** | **PIPE FITTING** | | |  |  |
|  |  | | 10.1 Pipes and pipe fitting- commonly used pipes. | 24 Hours | |
|  |  | | 10.2 Pipe schedule and standard sizes. |
|  |  | | 10.3 Use of tools such as pipe cutters, pipe wrenches, pipe dies, and tap, pipe bending machine etc. |  |  |
|  |  | | 10.4 Conditions used for pipe work to be followed. |  |  |
| **11** | **WELDING** | | |  |  |
|  |  | | 11.1 Safety-importance of safety and general precautions observed in a welding shop. | 34 Hours | |
|  |  | | 11.2 Precautions in electric and gas welding. (Before during and after welding). |
|  |  | | 11.3 Welding Machines and Accessories. |  |  |
|  |  | | 11.4 Description, method of operating CO2 welding. |  |  |
|  |  | | 11.5 Method of operating Gas welding equipment: Types of Joints-Butt and fillet. |  |  |
|  |  | | 11.6 Oxygen acetylene cutting-machine parts, uses, method of handling, cutting torch description, parts, function and uses. |  |  |
|  |  | | 11.7 Description of brazing process and its application. |  |  |
|  |  | | 11.8 Metallurgical and metal working processes such as Heat treatment, various heat treatment methods -normalizing, annealing, hardening, case hardening and tempering. |  |  |

1. **ASSESSMENT / EXAMINATION**

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| **1** | **BASIC/INTERNAL ASSESSMENT** | ( Mid of the stage) | **P/T** | **MARKS** |
|  |  | 1. Prepare project on Lathe. | T |  |
|  |  | 1. Internal assessment test on Lathe, Grinding, Dill, Shaping. | P |  |
| **2** | **FINAL PROJECT PRESENTATION** | ( Final stage of completion of session) |  |  |
|  |  | 1. Display & Submission – Safety & Precaution during Job. | T |  |
|  |  | 1. Display & Submission – Engineering Drawing. | T |  |
|  |  | 1. Display & Submission – Lathe, Drill operations. | P |  |
|  |  | 1. Display & Submission – Limit Fit & Tolerance | P |  |
|  |  | 1. Final test on given job to be done in Lathe. | P |  |