# Trades Details Summary

| Trade Name | Description | Duration (Days) |
|---|---|---|
| **Welding** | **Theory and practical session to give technical training in Welding trade** | **18** |

**Theory (Welding)**

| Topic | Keylearning Outcomes | Equipment Required | Duration |
|---|---|---|---|
| Registration of participants | • COVID Declaration • Participants Profile • Describe the role of a welding technician | Presentations, White Board | 2:0 |
| Welding safety & Knowledge about PPEs | • What is Safety • Awareness about General Safety • Welding Safety • Use of PPEs • Advantages of Safety • Cover the equipment so that there is limited contact with dust and moisture. • Clean the working area under the process regularly to create a healthy, clean and safe working environment. • Clean the equipment and process auxiliaries regularly to remove any dust, moisture, waste material which would have got collected on the equipment. • Identify potential hazards at the work site while engaging in a maintenance activity and take appropriate action. • Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals, loud noise. • Describe the safety procedures (firefighting, first aid) to be followed within the organization. • Describe the various types of PPE and their usage. • Operate the machine using the recommended Personal Protective Equipment (PPE). • Maintain a clean and safe working environment near the workplace and ensure there is no spillage of chemicals, production waste, oil, solvents etc. • Ensure the work area, tools, equipment and materials are clean. • Do's & Don't's | Presentations, White Board, Personal Protective Equipment (PPE*). Demonstration | 3:0 |
| Knowledge about Oxy Acetylene Gas cutting | • Principal of Gas Cutting Procedure • Gas Cutting Plant & Equipments • Classification of Flams • Efficiency of Gas Cutting • Gas Cutting Safety & Tips • Gas Cutting PPEs | Presentations, White Board, Personal Protective Equipment (PPE) | 2:0 |
| Doubt Clearing | • Feed Back • Group discussion | Presentations, White Board | 2:0 |
| Introduction of welding (SMAW/GMAW/GTAW) | • Definition of Welding • Explain different types of welding processes and associated equipment. • Importance of Welding • Uses of Welding • Clean the surface of the electrodes and the welding gun to remove dust and any other impurities by collaborating with the helper. • Clean other welding machine auxiliaries (Welding Transformer, Gas Discharge unit, Flux wire) before the initiation of the welding process. • Set up the welding apparatus as per the selected welding process, the internal operating procedures and the setting standards for the machine. | Presentations, White Board, Personal Protective Equipment (PPE*). | 2:0 |
| Welding equipments & machines (SMAW) | What is Welding Equipments • Types of Welding Machines - Transformer, AC / DC Machine, Rectifier, Inverter Base Machines, CC/CV modes • Accessories - Electrode Holder, Cable, Lugs, Wire Brush, Chipping hammer etc. • Duty Cycle of Welding Machines, Power Factor • Codal Life of Welding Machine | Presentations, White Board, Personal Protective Equipment (PPE*), Demonstration of accessories | 2:0 |
| Type of welding joints & Edge preparation | • List the features of different types of joints. • Butt Joint • 'T' Joint • Lap Joint • Corner Joint • Edge Joint • Type of Groove • Explain the basic principles of geometry and drawing. | Presentations, White Board, Personal Protective Equipment (PPE*). | 2:0 |
| Welding positions | • Down Hand • Horizontal • Vertical • Overhead • 5G Position (Pipe Welding) • 6G Position (Pipe Welding) | Training Kit (Presentations, White Board), personal protective equipment (PPE*). | 2:0 |

| | | | |
|---|---|---|---|
| Welding consumables | • What is Welding Consumables • Electrodes • Type of Electrode • Classification & Codification of Electrode • Type of Electrode Coating • Composition of Electrode • Coating Factor & Deposition Rate of Electrode • Storage & Handling of Welding Consumable • Identify the various welding parameters like temperature, pressure, electrode type, electrode distance (gap), Welding current, voltage, process time etc. before starting the welding process. • Select the correct type of electrode in terms of electrode material and thickness, filler material and flux which will be required for the selected welding process before the initiation of the welding process. | Presentations, White Board, Personal Protective Equipment (PPE*). | 2:0 |
| Precautions in Welding (Before, After & During) & Inspection | • Describe different cleaning methods for electrodes, metal surfaces etc. • Dry Electrode • Tacking & Clamping Before welding • Cleaning of Weld Bead after every pass (Interpass Cleaning) • Slag Removal • Spatter Cleaning • Brief Introduction of Destructive & Non Destructive Test • Visual Inspection • Clean the surface of the metal parts (work pieces) which need to be joined. • Remove any extra material, sharp edges etc. which might impact the final welded product by using chippers, grinders etc. • Ensure that the dimensions of the work pieces available on the welding line are as per the product drawing/ sketches available with the • Operator. • Explain how to use measuring instruments like vernier calipers, micrometer. | Presentations, White Board, Personal Protective Equipment (PPE*). | 2:0 |
| Welding Defects, causes & remedies | • What is Welding Defects • Defects & Discontinuities • Classification of Welding Defects • Explain the impact of various physical parameters like temperature, pressure, electrode distance on the properties of final output product like durability, ductility, surface feel etc. • Different Welding Defects - Cusses & Remedies • Identify quality defects in work pieces. • Discard the pieces which are beyond repair. • Explain the methods which can repair pieces with minor defects such as cutting, shearing, hammering, drilling etc. • Repair the pieces which need minor modifications/ rework. • Rectify minor defects like excess slag, shape deformation, sharp edges, rough surfaces, grooves, holes etc. By Fettling, chipping, cutting, sawing, filling, shearing, hammering etc. | Presentations, White Board, Personal Protective Equipment (PPE*). | 2:0 |
| Valedictory | • Work Ethics • Personal Financial Planning • Health | Presentations, White Board | 2:0 |
| Effective Communication | Subordinates • Peers • Superiors • Customers | Audio-Video | 5:0 |
| First Aid | • Electrocution • Cut • Bleeding • Faint • Bandage • Resuscitation • Ambulance | Audio-Video | 4:0 |
| Material Handling | • Movement of Raw Material • Movement of Finished Material • Waste Segregation • Cleanliness • Stacking | Audio-Video | 3:0 |
| Orientation Programme & Introduction about Entrepreneurship | • Entrepreneur, Entrepreneurship and Enterprise • Scheme & Types of Entrepreneurship • Importance of Entrepreneurship • Entrepreneurship Opportunities & Challenges • Startup Business • Cash Flow * Incubation Centre like DIC & IIT (BHU) | ppt | 2:0 |
| Financial Management | • Financial Management • Resources / Fund availability by Bank * Loan Scheme like Mudra Loan | Power Point Presentations, White Board | 2:0 |

**Practical (Welding)**

| Topic | Keylearning Outcomes | Equipment Required | Duration |
|---|---|---|---|
| Practical | • Arc Formation • Arc Stability | SMAW Welding Machine and Electrodes | 5:0 |
| Practical | • Learning Beading (12 mm Plate) | SMAW Welding Machine and Electrodes | 5:0 |
| Practical | • Learning Beading (12 mm Plate) | SMAW Welding Machine and Electrodes | 5:0 |
| Practical | • Learning Buildup (12 mm Plate) | SMAW Welding Machine and Electrodes | 9:0 |
| Practical | • Butt Joint (5 mm Plate) | SMAW Welding Machine and Electrodes | 10:0 |
| Practical | • Butt Joint (5 mm Plate) | SMAW Welding Machine and Electrodes | 5:0 |

| | | | |
|---|---|---|---|
| Practical | • 'T' Joint (5 mm Plate) | SMAW Welding Machine and Electrodes | 15:0 |
| Practical | • Gas cutting Practical | Oxy Acetylene Gas Cutting Plant | 5:0 |