



# Model Curriculum

**QP Name: Mine Welder**

**Elective: Underground Metal/ Opencast/ Underground Coal**

**Optional: Underground Gassy Mines**

**QP Code: MIN/Q3201**

**QP Version: 2.0**

**NSQF Level: 4**

**Model Curriculum Version: 2.0**

–Skill Council for Mining Sector || B-311, Okhla Industrial Area, Phase-I, New Delhi-110020  
Website: [www.skillcms.in](http://www.skillcms.in)



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## Training Parameters

<b>Sector</b>	Mining
<b>Sub-Sector</b>	Engineering Services
<b>Occupation</b>	Mechanical Services
<b>Country</b>	India
<b>NSQF Level</b>	4
<b>Aligned to NCO/ISCO/ISIC Code</b>	NCO-2015/7212.0200
<b>Minimum Educational Qualification and Experience</b>	8th grade pass plus 2-year NTC plus 1 Year NAC OR 8th pass plus 1-year NTC plus 1-Year NAC plus CITS OR 10th grade pass and pursuing continuous schooling OR 10th grade pass with 2 years relevant experience OR Previous relevant Qualification (Jr. Mine Welder ) of NSQF Level 3.0 with minimum education as 5th Grade pass with 2 years relevant experience
<b>Pre-Requisite License or Training</b>	NA
<b>Minimum Job Entry Age</b>	20 Years
<b>Last Reviewed On</b>	27/01/2022
<b>Next Review Date</b>	27/01/2025
<b>NSQC Approval Date</b>	27/01/2022
<b>QP Version</b>	2.0
<b>Model Curriculum Creation Date</b>	27/01/2022
<b>Model Curriculum Valid Up to Date</b>	27/01/2025
<b>Model Curriculum Version</b>	2.0
<b>Minimum Duration of the Course</b>	510 hours
<b>Maximum Duration of the Course</b>	540 hours

## Program Overview

This section summarizes the end objectives of the program along with its duration.

### Training Outcomes

At the end of the program, the learner will be able to:

- Demonstrate how to prepare the welding machine, auxiliaries and work pieces for the welding process
- Display how to conduct the welding process and weld the work piece
- Show how to perform the post welding operations activities
- Discuss health, safety and environmental guidelines for U/G Metalliferous, Opencast and U/G Coal Mines
- Demonstrate how to conduct special preparation for Welding at underground mines

### Compulsory Modules

The table lists the modules, their duration and mode of delivery.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
<b>Bridge Module(s)</b>	<b>10:00</b>	<b>00:00</b>	<b>00:00</b>		<b>10:00</b>
Module 1 - Introduction to the sector and the job role of Mine Welder	10:00	00:00	00:00		10:00
<b>MIN/N3201-Prepare the welding machine, auxiliaries and work pieces for the welding process</b> NOS Version No. -1.0 NSQF Level- 4	<b>30:00</b>	<b>60:00</b>	<b>50:00</b>		<b>140:00</b>
Prepare the welding machine, auxiliaries and work pieces for the welding process	30:00	60:00	50:00		140:00
<b>MIN/N3202-Conduct the welding process and weld the work piece</b> NOS Version No.- 1.0 NSQF Level - 4	<b>20:00</b>	<b>60:00</b>	<b>40:00</b>		<b>120:00</b>



Conduct the welding process and weld the work piece	20:00	60:00	40:00		120:00
<b>MIN/N3203- Post welding operations activities</b> NOS Version No.-1.0 NSQF Level - 4	<b>20:00</b>	<b>40:00</b>	<b>60:00</b>		<b>120:00</b>
Post welding operations activities	20:00	40:00	60:00		120:00
<b>DGT/VSQ/N0102: Employability Skills (60 Hours)</b> NOS Version No. 1 NSQF Level- 4	<b>24:00</b>	<b>36:00</b>	<b>00:00</b>	-	<b>60:00</b>
Introduction to Employability Skills	00:30	01:00	00:00	-	01:30
Constitutional values - Citizenship	00:30	01:00	00:00	-	01:30
Becoming a Professional in the 21st Century	01:00	01:30	00:00	-	02:30
Basic English Skills	04:00	06:00	00:00	-	10:00
Career Development & Goal Setting	01:00	01:00	00:00	-	02:00
Communication Skills	02:00	03:00	00:00	-	05:00
Diversity & Inclusion	01:00	01:30	00:00	-	02:30
Financial and Legal Literacy	02:00	03:00	00:00	-	05:00
Essential Digital Skills	04:00	06:00	00:00	-	10:00
Entrepreneurship	03:00	04:00	00:00	-	07:00
Customer Service	02:00	03:00	00:00	-	05:00
Getting Ready for Apprenticeship & Jobs	03:00	05:00	00:00	-	08:00
<b>Total Duration</b>	<b>104:00</b>	<b>196:00</b>	<b>150:00</b>	-	<b>450:00</b>

## Elective Modules

The table lists the elective modules, their duration and mode of delivery.

### Elective 1: Underground Metal

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
<b>MIN/N1702 -Follow Health, Safety, and Environmental guidelines for Underground Metalliferous Mines (UMM) (Including Mine Vocational Training Rule and Mine RescueRule)</b> <i>NOS Version No. 1.0</i> NSQF Level-4	10:00	20:00	30:00		60:00
Health and Safety for U/G metal mines	10:00	20:00	30:00		60:00
<b>Total Duration</b>	<b>10:00</b>	<b>20:00</b>	<b>30:00</b>		<b>60:00</b>

### Elective 2: Opencast

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
<b>MIN/N1703-Follow Health, Safety, and Environmental Guidelines for opencast mines (Including Mine Vocational Training Rule)</b> <i>NOS Version No. – 1.0</i> NSQF Level-4	10:00	20:00	30:00		60:00
Health and Safety for O/C mines	10:00	20:00	30:00		60:00
<b>Total Duration</b>	<b>10:00</b>	<b>20:00</b>	<b>30:00</b>		<b>60:00</b>

### Elective 3: Underground Coal

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
<b>MIN/N1704 -Follow Health, Safety, and Environmental Guidelinesfor underground coal mines (Including Mine Vocational Training Rule)</b> <i>NOS Version No. – 1.0</i> NSQF Level-4	10:00	20:00	30:00		60:00
Health and Safety for U/G Coal mines	10:00	20:00	30:00		60:00
<b>Total Duration</b>	<b>10:00</b>	<b>20:00</b>	<b>30:00</b>		<b>60:00</b>

### Optional Modules

The table lists the optional modules, their duration and mode of delivery.

#### Option 1: Underground Gassy Mines

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
<b>MIN/N3204-Special preparation for Welding at U/G Mines</b> <i>NOS Version No.- 1.0</i> NSQF Level -4	10:00	10:00	10:00		30:00
Special requirement for U/G welding work	10:00	10:00	10:00		30:00
<b>Total Duration</b>	<b>10:00</b>	<b>10:00</b>	<b>10:00</b>		<b>30:00</b>

# Module Details

## Module 1: Introduction to the sector and the job role of Mine Welder

*Bridge Module*

### Terminal Outcomes:

- Discuss the scope of a Mine Welder
- Explain the role and responsibilities of a Mine Welder.

<b>Duration:10:00</b>	<b>Duration:00:00</b>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>● Describe the concept of Welding Jobs in Mining</li> <li>● Discuss the role and the importance of a Mine Welder.</li> <li>● Explain various types of risks involved in Underground and Opencast Mines.</li> <li>● Discuss Regulatory context specified to work in Underground and Opencast Mines.</li> <li>● Identify the specific safety measures and their implementation.</li> <li>● Explain provision of wages, working hours and accident compensation as per Mines Act.</li> </ul>	
<b>Classroom Aids</b>	
LCD Projector, Laptop/Computer with internet, White Board, Flip Chart, Markers	
<b>Tools, Equipment and Other Requirements</b>	
Welding rod, power supply, welding metal, eye protector glass with cover, Burning elements, Safety Helmet, gloves, harness, protective clothes, earplugs, goggles, nose mask, Safety shoes, Fire extinguisher, Types of log book, First Aid box.	



## Module 2: Prepare the welding machine, auxiliaries and work piece for the welding process.

*Mapped to MIN/N3201, v1.0*

### Terminal Outcomes:

- Recall the welding requirements, welding equipment and parameters.
- Describe the process to arrange the material and equipment.
- Discuss how to clean the welding equipment and setup the equipment.
- Apply appropriate techniques to prepare the surface of the part (work pieces)

<b>Duration:30:00</b>	<b>Duration:60:00</b>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>● Explain the job-specific documents e.g. daily maintenance checklist and importance of the same.</li> <li>● Outline the right welding methodology and process to be adopted for completing the work order.</li> <li>● Discuss the risk and impact of not following defined procedures/work instructions.</li> <li>● Discuss all process manuals/ work instructions/Standard Operating Procedures (SOP) to understand the right welding methodology and process.</li> <li>● Discuss the hierarchy for reporting identified problems.</li> <li>● Discuss with the supervisor for given task/work.</li> <li>● Discuss the impact of damaged equipment on the company.</li> <li>● List the various welding parameters to be met with, before starting the welding process, as mentioned in the work Instructions/ SOP manual.</li> <li>● Recall the material required and the equipment availability for executing the activity of welding.</li> <li>● Distinguish between the various 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.</li> </ul>	<ul style="list-style-type: none"> <li>● Display all required material from the store before starting the welding process.</li> <li>● Demonstrate how to clean the surface of the electrodes and remove dust and any other impurities from the welding gun.</li> <li>● Display how to clean the other welding machine auxiliaries (welding transformer, gas discharge unit, flux wire) before the initiation of the welding process, as mentioned in the work instructions/ Standard Operating Procedures(SOP)</li> <li>● Display how to clean the surface of the metal parts (work pieces) which need to be joint.</li> <li>● Show how to prepare the edge for the strongest possible weld using techniques like machining, chipping, grinding, oxy-acetylene cutting and carbon arc cutting.</li> </ul>

- Recall the correct type of electrodes as per the parameters used for the welding process.
- List the implications of delays in the process.
- Explain the handover and takeover procedures of the mine welder according to company's SOP.
- Discuss the safety guidelines specified by Directorate General of Mines Safety (DGMS) specific to welding works.
- Enlist the material and the equipment required for executing the activity.
- Discuss the different types of mines and detail of the mine one is working in.
- Explain the benching in quarries, dressing of overhangs, undercuts, fencing.
- Describe the importance of first aid and hygiene.
- State the code of practice in specific areas of the mine.
- Discuss the standing orders in force at the mine.
- Discuss how to set up the welding apparatus as per the selected welding process and the internal SOPs/ Work instructions and the setting standard for the machine.
- Discuss how to ensure that the parameters for edge parameters are as per the desired specifications.
- Explain the importance of safety in the vicinity of machinery.
- Discuss about shot-firing / blasting related safety regulations including taking shelter during blasting.
- Throw light on how to take the work permission/authorization from mines manager if required.
- Discuss duties of workmen under the Mines Act-1952.
- Discuss the provision of compensation and working hours, leaves, etc. as per Mines Act-1952.
- List the outcome of violation of safety

<p>procedures.</p> <ul style="list-style-type: none"> <li>● Discuss the emergency response /disaster management plan prepared by the organization.</li> <li>● Discuss different types of welding processes and associated equipment.</li> <li>● State different cleaning methods for electrodes, metal surfaces etc.</li> <li>● Describe how to use measuring instruments.</li> <li>● Enlist different types of welding joints.</li> <li>● Explain the procedure to issue and receive material from the stock.</li> <li>● Discuss the impact of various physical parameters on the properties of final output product.</li> <li>● State the basic principles of geometric and drawing.</li> <li>● Describe the methods of edge preparation and associated equipment.</li> </ul>	
<p><b>Classroom Aids</b></p>	
<p>LCD Projector, Laptop/Computer with internet, White Board, Flip Chart, Markers</p>	
<p><b>Tools, Equipment and Other Requirements</b></p>	
<p>Welding rod, power supply, welding metal, eye protector glass with cover, Burning elements, Safety Helmet, gloves, harness, protective clothes, earplugs, goggles, nose mask, Safety shoes, Fire extinguisher, Types of log book, First Aid box, Flux, Filler material, Electrodes</p>	

## Module 3: Conduct the welding process and weld the work piece

Mapped to MIN/N3202, v1.0

### Terminal Outcomes:

- Demonstrate how to install the welding work pieces on the welding apparatus
- Show how to check the operations of the welding machines and auxiliaries and conduct a test process
- Demonstrate how to perform the actual welding process
- Discuss how to monitor the process parameters to ensure error free welding
- Display how to measure both welded pieces and remove welding inconsistency

Duration:20:00	Duration:60:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> <li>● Explain job-specific documents e.g. daily maintenance checklist and importance of the same.</li> <li>● Discuss the risk and impact of not following defined procedures/work instructions.</li> <li>● State the hierarchy for reporting identified problems.</li> <li>● Discuss the impact of damaged equipment on the company.</li> <li>● Outline the shift direction hazard.</li> <li>● Describe the implications of delays in the process.</li> <li>● Explain handover and takeover procedures of the welding work according to company's SOP.</li> <li>● Discuss the safety guidelines specified by Directorate General of Mines Safety (DGMS) specific to welding operations.</li> <li>● Discuss different types of mines and detail of the mine one is working.</li> <li>● Explain the benching in quarries, dressing of overhangs, undercuts, fencing.</li> <li>● Describe the importance of first aid and hygiene.</li> <li>● State the code of practice in specific areas of the mine.</li> <li>● Explain how to monitor the welding process by observing the readings on the panels/ measuring instruments to prevent any harm to the work pieces due to overheating, burning, over melting, change in applied pressure etc.</li> </ul>	<ul style="list-style-type: none"> <li>● Demonstrate how to hold the parts (Jigs) which need to be welded together using a clamp and align them with the electrodes as per the job requirement.</li> <li>● Show how to install the work pieces on the welding apparatus, keeping in mind the parameters as specified in the welding SOP/ Control plan documents/work Instructions and instructed by the supervisor.</li> <li>● Apply appropriate techniques to check for operation of core welding equipment like welding gun, welding transformer, gas cylinders and gas discharge as per set up documentation.</li> <li>● Show how to conduct the destructive and non- destructive test activity to ensure conformance to the SOPs/ work instructions.</li> <li>● Role Play the situation on how to inform the supervisor to make modifications in the welding parameters as per the test activity outcomes and the prescribed standard for destructive/ nondestructive Tests.</li> <li>● Demonstrate how to adjust the current/ voltage, temperature application as per the welding requirement and the activity test conducted earlier so that the desired heat can be created for the welding process.</li> <li>● Show how to check the positioning of the spot and the welding gun as per the work</li> </ul>

- State the standing orders in force at the mine.
- Outline the observations in the prescribed format.
- Discuss the importance of safety in the vicinity of machinery.
- Discuss about shot-firing / blasting related safety regulations including taking shelter during blasting.
- Discuss how to ensure that the assistant operators/ helpers remove extra material by using chippers, grinders etc., in case the parts are not as per the given measurements.
- Discuss the duties of workmen under the Mines Act-1952.
- Discuss the provision of compensation and working hours, leaves, etc. as per Mines Act-1952.
- State the outcome of violation of safety procedures.
- Discuss the emergency response /disaster management plan prepared by the organization.
- Discuss the different types of welding processes and associated equipment.
- State different types of joints used in welding.
- Describe the different cleaning methods for electrodes, metal surfaces etc.
- Explain the methods of using instruments like Vernier calipers, Micrometers, rulers and other inspection tools.
- Discuss the various national and International welding standard used in mining sector in India.
- Throw light on how to visually represent the final product outcome.
- Describe the different types of defects in welding and their impact.
- Outline the potential health and safety hazards and related Safety precautions to be undertaken during the welding process.
- State the basic chemical properties of

instructions and the work order.

- Show how to hold the filler metal/ Flux material wire and the Welding Gun are at the recommended angle and distance mentioned in the setup document, keeping the work pieces' stationary to ensure the required melting of base metal.
- Demonstrate how to ensure the flow of filler material/ gas discharge as per the welding standard prescribed in the SOP/ Work Instructions.
- Conduct the welding process by observing the readings on the panels/ measuring instruments to prevent any harm to the work pieces due to overheating, burning, over melting, change in applied pressure etc.
- Show how to measure the final welded piece and compare the dimensions as prescribed in the work order engineering drawing.
- Show how to ensure the hammering of the bulges to give the work pieces the desired shape, in case of any dents or bulges.

<p>material used for electrodes, flux, welding gases etc.</p> <ul style="list-style-type: none"> <li>● Discuss the basic electrical laws and working of welding transformers, capacitors etc.</li> <li>● Explain about the DC welding machines, checking voltage of machines etc.</li> <li>● Illustrate the welding gauges, different type of gauges etc.</li> </ul>	
<p><b>Classroom Aids</b></p>	
<p>LCD Projector, Laptop/Computer with internet, White Board, Flip Chart, Markers</p>	
<p><b>Tools, Equipment and Other Requirements</b></p>	
<p>Welding rod, power supply, welding metal, eye protector glass with cover, Burning elements Sample Helmet, gloves, harness, protective clothes, earplugs, goggles, nose mask, Safety shoes, Fire extinguisher, Types of log book, First Aid box, chippers, grinders, flux, filler material, welding gases, electrodes, jigs, welding gun, welding transformer, gas cylinders, hoist, lifts, crane</p>	

## Module 4: Post welding operations activities

Mapped to MIN/N3203, v1.0

### Terminal Outcomes:

- Demonstrate how to inspect finished goods to detect any deviations from the product design.
- Discuss how to maintain the records for production and defective pieces.
- Describe how to unload and store the finished goods.
- Discuss how to ensure cleanliness and 5S is maintained at the workplace.
- Explain how to conduct regular preventive maintenance of equipment.

Duration:20:00	Duration:40:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> <li>● Explain the job-specific documents e.g. daily maintenance checklist and importance of the same.</li> <li>● Discuss the risk and impact of not following defined procedures/work instructions.</li> <li>● Describe how to compare the texture, color, surface properties, hardness and strength with the given specifications described the in work order/ work Instructions.</li> <li>● State the hierarchy for reporting identified problems.</li> <li>● Discuss the impact of damaged equipment on the company.</li> <li>● Explain how to ensure the pieces which do not meet the specified standard and cannot be repaired are discarded.</li> <li>● Describe the implications of delays in the process.</li> <li>● Discuss how to maintain the data records for quality defects and pieces which are beyond repair.</li> <li>● Explain how to prepare all documentation correctly on time.</li> <li>● Throw light on how to report the completion of job allocated during the</li> </ul>	<ul style="list-style-type: none"> <li>● Demonstrate how to inspect the output products by comparing the dimensions of the output pieces with the specifications of the finished product using various measuring devices.</li> <li>● Display how to separate the defective pieces into two categories i.e. repairable and beyond repair by putting tags/ markings on the welded jig/ work piece surface.</li> <li>● Display how to ensure that the output pieces are correctly clamped and lifted using suitable equipment like hoist, lifts, crane, etc.</li> <li>● Demonstrate how to check the working of all bearing, rollers, shafts etc. and oil all moving parts of the equipment on a periodic basis.</li> <li>● Show how to check the working of non-moving parts and periodically conduct preventive maintenance to prevent machine failure.</li> <li>● Apply appropriate techniques to check the equipment calibration periodically and report any errors to the maintenance teams for rectification.</li> </ul>

shift, problems encountered and further actions that need to be taken.

- Explain the handover and takeover procedures of the mine welder according to company's SOP.
- Discuss the safety guidelines specified by Directorate General of Mines Safety (DGMS) specific to mine welding operations.
- Discuss different types of mines and detail of the mine one is working in.
- Describe the benching in quarries, dressing of overhangs, undercuts, fencing.
- Explain how to ensure that there is no damage to the lifted work pieces.
- Outline the importance of first aid and hygiene.
- Discuss how to carry the output product to the designated area using hangars, conveyor belts, cranes, forklifts etc.
- State the code of practice in specific areas of the mine.
- Discuss how to store the equipment in a proper order as indicated in the equipment manual and the designated area.
- Discuss the standing orders in force at the mine.
- Discuss how to ensure equipment and the work place are regularly cleaned and that there is not accumulation of dust, moisture and waste material.
- Outline the importance of safety in the vicinity of machinery.
- Throw light on the "5-S" practice at work place.
- Discuss about shot-firing / blasting related safety regulations including taking shelter during blasting.
- Discuss the duties of workmen under the Mines Act-1952.
- Discuss the provision of compensation and working hours, leaves, etc. as per Mines Act-1952.
- State the outcome of violation of safety



<p>procedures.</p> <ul style="list-style-type: none"> <li>● Discuss the emergency response /disaster management plan prepared by the organization.</li> <li>● Explain the techniques of using measurement instruments.</li> <li>● Recall the guidelines to identify quality defects in work pieces visual/ test based.</li> <li>● Discuss the methods used for cutting, shearing, hammering, drilling which can repair pieces with minor defects.</li> <li>● List the basic level maintenance and cleaning techniques.</li> <li>● State the various solvents, chemicals, lubricants etc used during the maintenance processes.</li> <li>● Explain the procedure for arranging the equipment in the prescribed manner including tagging and numbering of machine parts.</li> <li>● List the safety precautions to be taken during cleaning and maintenance activities.</li> <li>● State the basic welding defects and corrective measures.</li> <li>● Describe the basic level operations of lifting equipment like hoists, cranes, pulley etc.</li> </ul>	
<p><b>Classroom Aids</b></p>	
<p>LCD Projector, Laptop/Computer with internet, White Board, Flip Chart, Markers</p>	
<p><b>Tools, Equipment and Other Requirements</b></p>	
<p>Welding rod, power supply, welding metal, eye protector glass with cover, Burning elements Sample Helmet, gloves, harness, protective clothes, earplugs, goggles, nose mask, Safety shoes, Fire extinguisher, Types of log book, First Aid box, chippers, grinders, flux, filler material, welding gases, electrodes, jigs, welding gun, welding transformer, gas cylinders, hoist, lifts, crane</p>	

## Employability Skills (60 Hours)

Mapped to DGT/VSQ/N0102, v1.0

<i>Key Learning Outcomes</i>	
<b>Introduction to Employability Skills</b>	<b>Duration: 1.5 Hours</b>
<ol style="list-style-type: none"> <li>1. Discuss the Employability Skills required for jobs in various industries</li> <li>2. List different learning and employability related GOI and private portals and their usage</li> </ol>	
<b>Constitutional values - Citizenship</b>	<b>Duration: 1.5 Hours</b>
<ol style="list-style-type: none"> <li>3. Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen</li> <li>4. Show how to practice different environmentally sustainable practices.</li> </ol>	
<b>Becoming a Professional in the 21st Century</b>	<b>Duration: 2.5 Hours</b>
<ol style="list-style-type: none"> <li>5. Discuss importance of relevant 21st century skills.</li> <li>6. Exhibit 21st century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life.</li> <li>7. Describe the benefits of continuous learning.</li> </ol>	
<b>Basic English Skills</b>	<b>Duration: 10 Hours</b>
<ol style="list-style-type: none"> <li>8. Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone</li> <li>9. Read and interpret text written in basic English</li> <li>10. Write a short note/paragraph / letter/e-mail using basic English</li> </ol>	
<b>Career Development &amp; Goal Setting</b>	<b>Duration: 2 Hours</b>
<ol style="list-style-type: none"> <li>11. Create a career development plan with well-defined short- and long-term goals</li> </ol>	
<b>Communication Skills</b>	<b>Duration: 5 Hours</b>
<ol style="list-style-type: none"> <li>12. Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette.</li> <li>13. Explain the importance of active listening for effective communication</li> <li>14. Discuss the significance of working collaboratively with others in a team</li> </ol>	
<b>Diversity &amp; Inclusion</b>	<b>Duration: 2.5 Hours</b>
<ol style="list-style-type: none"> <li>15. Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD</li> <li>16. Discuss the significance of escalating sexual harassment issues as per POSH act.</li> </ol>	
<b>Financial and Legal Literacy</b>	<b>Duration: 5 Hours</b>
<ol style="list-style-type: none"> <li>17. Outline the importance of selecting the right financial institution, product, and service</li> <li>18. Demonstrate how to carry out offline and online financial transactions, safely and securely</li> <li>19. List the common components of salary and compute income, expenditure, taxes, investments etc.</li> <li>20. Discuss the legal rights, laws, and aids</li> </ol>	
<b>Essential Digital Skills</b>	<b>Duration: 10 Hours</b>
<ol style="list-style-type: none"> <li>21. Describe the role of digital technology in today's life</li> <li>22. Demonstrate how to operate digital devices and use the associated applications and features, safely and securely</li> <li>23. Discuss the significance of displaying responsible online behavior while browsing, using various social media platforms, e-mails, etc., safely and securely</li> <li>24. Create sample word documents, excel sheets and presentations using basic features</li> <li>25. Utilize virtual collaboration tools to work effectively</li> </ol>	
<b>Entrepreneurship</b>	<b>Duration: 7 Hours</b>
<ol style="list-style-type: none"> <li>26. Explain the types of entrepreneurship and enterprises</li> <li>27. Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan</li> <li>28. Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per</li> </ol>	

requirement
29. Create a sample business plan, for the selected business opportunity
<b>Customer Service</b> <span style="float: right;"><b>Duration: 5 Hours</b></span>
30. Describe the significance of analyzing different types and needs of customers
31. Explain the significance of identifying customer needs and responding to them in a professional manner.
32. Discuss the significance of maintaining hygiene and dressing appropriately
<b>Getting Ready for apprenticeship &amp; Jobs</b> <span style="float: right;"><b>Duration: 8 Hours</b></span>
33. Create a professional Curriculum Vitae (CV)
34. Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively
35. Discuss the significance of maintaining hygiene and confidence during an interview
36. Perform a mock interview
37. List the steps for searching and registering for apprenticeship opportunities

### Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
Graduate/CITS	Any discipline	-	-	2	Teaching experience	Prospective ES trainer should: <ul style="list-style-type: none"> <li>• have good communication skills</li> <li>• be well versed in English</li> <li>• have digital skills</li> <li>• have attention to detail</li> <li>• be adaptable</li> <li>• have willingness to learn</li> </ul>
Current ITI trainers	Employability Skills Training (3 days full-time course done between 2019-2022)	-	-	-	-	
Certified current EEE trainers (155 hours)	from Management SSC (MEPSC)	-	-	-	-	
Certified Trainer	Qualification Pack: Trainer (MEP/Q0102)	-	-	-	-	

Trainer Certification	
Domain Certification	Platform Certification
Certified in 60-hour Employability NOS (2022), with a minimum score of <b>80%</b>  <b>OR</b>  Certified in 120-, 90-hour Employability NOS (2022), with a minimum score of <b>80%</b>	MEP/Q2601, v2.0 Trainer (VET and Skills). Minimum accepted score as per SSC guideline is 80%.

### Master Trainer Requirements

Master Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
Graduate/CITS	Any discipline	-	-	3	Employability Skills curriculum training experience with an interest to train as well as orient other peer trainers	Prospective ES Master trainer should: <ul style="list-style-type: none"> <li>• have good communication skills</li> <li>• be well versed in English</li> <li>• have basic digital skills</li> </ul>
Certified Master Trainer	Qualification Pack: Master Trainer (MEP/Q2602)	-	-	3	EEE training of Management SSC (MEPSC) (155 hours)	<ul style="list-style-type: none"> <li>• have attention to detail</li> <li>• be adaptable</li> <li>• have willingness to learn</li> <li>• be able to grasp concepts fast and is creative with teaching practices and likes sharing back their learning with others</li> </ul>

Master Trainer Certification	
Domain Certification	Platform Certification
Certified in 60-hour Employability NOS (2022), with a minimum score of <b>90%</b> .  <b>OR</b>  Certified in 120-, 90-hour Employability NOS (2022), with a minimum score of <b>90%</b>	MEP/Q2602, v2.0 Master Trainer (VET and Skills). Minimum accepted score as per SSC guideline is 90%.

### Assessment Strategy

The trainee will be tested for the acquired skill, knowledge and attitude through formative/summative assessment at the end of the course and as this NOS and MC is adopted across sectors and qualifications, the respective AB can conduct the assessments as per their requirements.

LIST OF TOOLS & EQUIPMENT FOR EMPLOYABILITY SKILLS		
S No.	Name of the Equipment	Quantity
1.	Computer (PC) with latest configurations – and Internet connection with standard operating system and standard word processor and worksheet software (Licensed) (all software should either be latest version or one/two version below)	As required
2.	UPS	As required
3.	Scanner cum Printer	As required
4.	Computer Tables	As required
5.	Computer Chairs	As required
6.	LCD Projector	As required
7.	White Board 1200mm x 900mm	As required
<i>Note: Above Tools &amp; Equipment not required, if Computer LAB is available in the institute.</i>		

#### Proposed Assessment Strategy/Guidelines:

1. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria mentioned above).
2. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training center based on these criteria.



## Module 5: Follow Health, Safety, and Environmental guidelines for Underground Metalliferous Mines (UMM) (Including Mine Vocational Training Rule and Mine Rescue Rule)

Mapped to MIN/N1702, v1.0

### Terminal Outcomes:

- Describe the work-site health and safety measures
- Discuss the environmental guidelines

<b>Duration:10:00</b>	<b>Duration:20:00</b>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>● Explain how to undertake "The Take-5 (Personal Risk Assessment)" before commencement of any work (DGMS Tech. circulars 2/2014).</li> <li>● Discuss how to comply with safety, health and security-related regulations/guidelines at the mine e.g. follow Standard Operating Procedure (SOP) for material handling in underground (U/G) mine, safety guidelines specified by Directorate General of Mine Safety (DGMS).</li> <li>● List the precautions to be followed against U/G electrical appliances.</li> <li>● List appropriate safety practices while traveling on U/G haul roads, in case of post blast fumes and misfire.</li> <li>● Discuss the manufacturer’s instructions for care and safe operation of mine machinery and equipment.</li> <li>● Discuss about various types of gases found in the mine and their effect.</li> <li>● Discuss the laid out procedure to be followed in case of gas detecting alarm signal on leakage of inflammable gases.</li> </ul>	<ul style="list-style-type: none"> <li>● Demonstrate how to operate various types of fire extinguishers to control different types of fire at a worksite when required.</li> <li>● Show how to use self-rescue apparatus, appropriately when required.</li> <li>● Read line diagram of ventilation circuit to identify the working ventilation district, to direct air to the working face.</li> </ul>

- Shed light on how to use appropriate PPE as per the requirement.
- Discuss how to identify six directional hazards at workplace and take decisions accordingly.
- Discuss how to check that roof supporting is as per Systematic Support Plan (SSP) and approved Systematic Support Rules (SSR) while undertaking work in an area.
- Discuss how to follow appropriate Standard Operating Procedure while working near any isolated and sealed off area of the mine.
- List the different types of machineries used in U/G mines.
- Throw light on provision of medical examination (IME & PME) of person employed as per Mines Rules 1955.
- State the importance of first aid and hygiene.
- Explain how to take precaution against occupational health hazards (like dust, water, mine gases etc.) due to U/G working environment.
- Discuss duties and rights of workers, as well as the safety and occupational health policy of organization.
- Throw light on the selection process of person for rescue training.
- Cite about the isolation and sealed off area of the mine.
- Discuss the various problems/incidents likely to occur and precautions to be taken when handling heavy equipment.
- State the mine safety standard including illumination level, noise levels, dust level, pollutants, etc. at the work-site.
- List the common sources of pollution in the mines and ways to minimize it.
- Discuss how to follow process for reporting any unsafe act/condition in work area to the concerned person.
- Describe how to use underground mine communication system.
- Throw light on how to ensure positive

isolation near the work place if applicable.

- Describe about the safety appliances and rescue equipment.
- State how to report any symptoms of illness to the shift-in-charge.
- Outline the role of Internal Safety Organisation, safety committee, workman's inspector and DGMS.
- Discuss the mining area-specific signs, and other safety and emergency signals and the outcome of violation of safety procedures.
- List the role and responsibilities of rescue room and rescue station and how to contact them in case of emergency.
- State the importance of taking shelter at the miner's station during blasting operation.
- Discuss about the safety equipment like safety shoes, safety belt, tight fit clothing, hand gloves, safety goggles, Gas Detector, Safety Lamp, Self-Contained Breathing Apparatus, gum boots, ear plugs, Face Mask, etc. and importance of FAB (Fresh Air Base).
- Describe shot-firing / blasting related safety regulations including taking shelter during blasting.
- Throw light on the emergency response /disaster management plan prepared by the organization as per DGMS guideline.
- Explain the rules and regulations for safety and security while handling hazardous materials.
- Outline the basic provisions in Mines Creche Rules, 1966 (MCR) for females employed in the mines.
- Discuss the importance of sensitization towards different genders and persons with disabilities. (PWD).
- Explain the importance of following infection control policies, '5-S' practices, and waste management.
- Discuss the importance of water/material/energy conservation and



<p>management.</p> <ul style="list-style-type: none"> <li>● Discuss Safety Management Plan (SMP) and Emergency Management Plan (EMP).</li> <li>● Explain how to maintain hand hygiene by washing hands with alcohol based sanitisers/soap.</li> <li>● Elucidate on how to maintain hygiene at the work site and disinfect the machine/tools before and after work/task.</li> <li>● Discuss the environmental impact of mining related operations and steps to reduce those impacts.</li> <li>● Throw light on the mineral conservation practices in U/G mining operations to achieve optimum ore or mineral recovery.</li> <li>● Explain how to ensure that stowing practices produce minimum disturbance to the surface.</li> <li>● Discuss how to ensure that the subgrade ore is carried out to surface and stacked separately at the earmarked place.</li> <li>● Explain how to ensure the productivity of the machine for material/fuel conservation.</li> </ul>	
<p><b>Classroom Aids</b></p>	
<p>LCD Projector, Laptop/Computer with internet, White Board, Flip Chart, Markers</p>	
<p><b>Tools, Equipment and Other Requirements</b></p>	
<p>Welding rod, power supply, welding metal, eye protector glass with cover, Burning elements Sample Helmet, gloves, harness, protective clothes, earplugs, goggles, nose mask, Safety shoes, Fire extinguisher, Types of log book, First Aid box, chippers, grinders, flux, filler material, welding gases, electrodes, jigs, welding gun, welding transformer, gas cylinders, hoist, lifts, crane</p>	

## Module 6: Follow Health, Safety, and Environmental Guidelines for opencast mines (Including Mine Vocational Training Rule)

Mapped to MIN/N1703, v1.0

### Terminal Outcomes:

- Describe the work-site health and safety measures.
- Discuss the Environmental guidelines

Duration:10:00	Duration:20:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> <li>● Explain how to comply with safety, health, and security-related regulations/guidelines at the open cast mine and safety instructions given by the workman's inspector.</li> <li>● Describe about various environmental awareness program related to mining, organized by the various government bodies/ company.</li> <li>● Discuss how to follow adequate safety while working at haul roads, heights, overburden dumps, sump area, stockyard, near moving parts, etc.</li> <li>● Recall the safety precautions to be taken while working on sites (sub-station, workshop etc.), with equipment, and conducting welding and cutting operations.</li> <li>● Discuss how to follow appropriate Safe Operating Procedure (SOP) while dealing with explosives.</li> <li>● Illustrate how to respond promptly and appropriately to an accident/ incident or an emergency situation, within limits of the role and responsibility.</li> <li>● Discuss usage of appropriate PPE as per the requirement.</li> <li>● Explain how to maintain hand hygiene by washing hands with alcohol based sanitisers/soap.</li> <li>● Elucidate on how to maintain hygiene at the work site and disinfect the machine/tools before and after work/task.</li> <li>● State how to report any symptoms of</li> </ul>	<ul style="list-style-type: none"> <li>● Show how to provide first aid to an injured person.</li> <li>● Display how to operate various types of fire extinguishers to control different types of fire at a worksite when required.</li> <li>● Role-play the situations on how to assist supervisor for reducing environmental impact caused due to related mining operations.</li> </ul>

illness to the shift-in-charge.

- Discuss the safety guidelines specified by Directorate General of Mine Safety (DGMS).
- List basic mining terminologies and definitions.
- Explain about the means of access and egress from the mines, location of workshop, haul roads and working face including dump yards.
- Outline about the shot-firing / blasting related safety regulations including taking shelter during blasting.
- Discuss the duties of workers, working hours and accident compensation as per under The Mines act-1952.
- Throw light on the hierarchy of the reporting.
- Recall the proper documents specific to the machine.
- Discuss about the machine operation, condition of the machine and worksite.
- Throw light on various problems/ incidents and precautions to be taken when handling heavy equipment.
- Throw light on the environmental impact of related opencast mining operations.
- Discuss how to follow the process for collecting, storing and disposing of the hazardous material and waste (like used oil, lubricant, battery, etc.) in compliance with worksite guidelines.
- Explain the process of top soil removal and management and ensure not to mix topsoil with waste in day to day tasks.
- Discuss how to ensure that HEMM is washed at the designated location.
- Illuminate on how to ensure the productivity of the machine for material/fuel conservation.
- Discuss the mineral conservation practices specified by the organization in accordance with MCDR-2017 (Mineral Conservation and Development Rules).
- Discuss the role of workmen inspector,

<p>safety committee and internal safety organization.</p> <ul style="list-style-type: none"> <li>● Throw light on the signages, mining area-specific signs, and other safety and emergency signals.</li> <li>● State the outcome of violation of safety procedures.</li> <li>● Summarise the importance of sensitization towards different genders and PWD (Persons with Disabilities).</li> <li>● Throw light on mine sump and pumping system of the mines.</li> <li>● State the mine safety standard including illumination level, noise levels, dust level, pollutants, etc. at the work-site.</li> <li>● List the common sources of pollution in the mines and ways to minimize it.</li> <li>● Enlist the safety equipment like safety shoes, safety belt, tight fit clothing, hand gloves, safety goggles, gas detector, safety lamp, self-contained breathing apparatus, gum boots, ear plugs, face mask, etc.</li> <li>● Discuss emergency response /disaster management plan prepared by the organization.</li> </ul>	
<p><b>Classroom Aids</b></p>	
<p>LCD Projector, Laptop/Computer with internet, White Board, Flip Chart, Markers</p>	
<p><b>Tools, Equipment and Other Requirements</b></p>	
<p>Welding rod, power supply, welding metal, eye protector glass with cover, Burning elements Sample Helmet, gloves, harness, protective clothes, earplugs, goggles, nose mask, Safety shoes, Fire extinguisher, Types of log book, First Aid box, chippers, grinders, flux, filler material, welding gases, electrodes, jigs, welding gun, welding transformer, gas cylinders, hoist, lifts, crane</p>	

## Module 7: Follow Health, Safety and Environmental Guidelines for Underground Coal Mines

Mapped to MIN/N1704, v1.0

### Terminal Outcomes:

- Discuss worksite health and safety measures and environmental guidelines.

<b>Duration:10:00</b>	<b>Duration:20:00</b>
<p><b>Theory – Key Learning Outcomes</b></p> <ul style="list-style-type: none"> <li>● List the preventive measures against firedamp, white damp, blackdamp etc.</li> <li>● Explain the importance of undertaking "The Take-5 (Personal Risk Assessment)" before commencement of any work (DGMS Tech. circulars 2/2014).</li> <li>● Discuss how to check that roof supporting is as per Systematic Support Plan (SSP) and approved Systematic Support Rules (SSR while undertaking work in an area.</li> <li>● Throw light on various types of gases available in the mine and their effects; and their control measures.</li> <li>● Discuss how to comply with safety, health and security-related regulations/guidelines at the mine.</li> <li>● Describe how to ensure that oil, grease, canvas or other inflammable material are stored in fire-proof receptacle.</li> <li>● Discuss the importance of ensuring that every instrument, apparatus and equipment are DGMS approved before these are used.</li> <li>● List the safety precautions to be followed against spontaneous heating of the coal.</li> <li>● Discuss how to ensure that no person is traveling/working/staying under unsupported roof.</li> <li>● Throw light on how to take precaution against occupational health hazards due to U/G working environment.</li> <li>● Discuss the importance of reporting any symptoms of illness to the shift-in charge.</li> <li>● Discuss Safety Management Plan (SMP)</li> </ul>	<p><b>Practical – Key Learning Outcomes</b></p> <ul style="list-style-type: none"> <li>● Show how to use the flame safety lamp for detecting the methane gas as per Standard Operating Procedure (SOP).</li> <li>● Demonstrate how to operate various types of fire extinguishers to control different types of fire at worksite, if required.</li> <li>● Display how to use self-rescue apparatus appropriately when required.</li> <li>● Read the line diagram of ventilation circuit to identify the working ventilation district to direct air to the working face.</li> <li>● Demonstrate how to keep Armoured face conveyor (AFC) and chocks in straight line for every cycle of operations and tightened up to the setting pressure while keeping it in full contact with the roof, applicable for long wall mining.</li> <li>● Show how to provide first aid to an injured person.</li> </ul>

and Emergency Management Plan (EMP) and precautions against U/G electrical appliances.

- Discuss the safety guidelines specified by Directorate General of Mine Safety (DGMS) and selection process of person for rescue training.
- Elucidate on how to take proper care against damage and accidents while loading, transporting, dismantling and erecting of roof supports.
- Throw light on how to follow appropriate SOP while working near any isolated and sealed off area of the mine.
- Discuss the provision of medical examination (Initial Medical Examination (IME) & Periodical Medical Examination (PME)) of a person employed, as per Mines Rules 1955.
- List different types of machineries used in U/G mines.
- Enlist different types of supporting system used in U/G mines as per SSP and SSR.
- Cite precautions to be taken when handling heavy equipment.
- Discuss how to ensure that the roof and sidewalls of the mine face (or newly exposed area of the mines) have been scaled/ dressed properly.
- List relevant safety precautions to be taken during depillaring operation in UCM.
- Recall the safety precautions to be followed while traveling on U/G haul roads, in case of post blast fumes and misfire.
- Discuss the manufacturer's instructions for care and safe operation of mine machinery and equipment.
- Throw light on the laid out SOP in case of alarm signal for leakage of inflammable gases.
- Explain the process of reporting any unsafe act/condition in the working area

to the concerned person.

- Discuss how to use underground mine communication system.
- Elucidate the importance of positive isolation near the work.
- Discuss the importance of using appropriate Personal Protective Equipment (PPE) as per the requirement.
- Explain how to maintain hand hygiene by washing hands with alcohol based sanitisers/soap, disinfect the machine/tools before and after work/task and maintain hygiene at the work site.
- Discuss how to identify six directional hazards at workplace and take decisions accordingly.
- Discuss the environmental impact of mining related operations and steps to reduce those impacts.
- Throw light on the mineral conservation practices in U/G mining operations to achieve optimum ore or mineral recovery.
- Describe how to ensure that the stowing practices produce minimum disturbance to the surface.
- Discuss how to ensure that the subgrade coal is carried out to surface and stacked separately at the earmarked place.
- Throw light on how to ensure the productivity of the machine for material/fuel conservation.
- Outline the process for collecting, storing and disposing of the hazardous material and waste (like used oil, lubricant, battery, etc.) in compliance with worksite guidelines.
- Discuss the "5-S" practice at work site.
- Discuss the duties and rights of workers.
- List the various electrical problems/incidents likely to occur.
- Throw light on the role of Internal Safety Organization, safety committee, workman's inspector and DGMS.

- State mine safety standard including light illumination level, noise levels, dust level, pollutants, etc. at the work-site.
- List common sources of pollution in the mines and ways to minimize it.
- Discuss shot-firing / blasting related safety regulations including taking shelter during blasting.
- Recall mining area-specific signs, and other safety and emergency signals.
- Discuss the outcome of violation of safety procedures.
- List safety appliances and rescue equipment.
- Discuss the safety and occupational health policy of organisation.
- Explain the importance of FAB (Fresh Air Base).
- State basic provisions in Mines Creche Rules, 1966 (MCR) for any females employed in the mines.
- Discuss about basic safety regulations of Coal Mines Regulation, 2017 (CMR).
- List types of stone dust barrier and its importance.
- Explain coal dust explosion and its preventive measures.
- Classify coal mines as per the degree of gassiness of coal seams such as first degree, second degree, and third-degree mines.
- List the precautions to be taken as per the gassiness of the coal mines.
- Discuss about coal mines occupational disease and their preventive measures.
- List the roles, duties and responsibilities of rescue team members, rescue room and rescue station.
- Discuss how to contact them in case of emergency.
- Enlist the correct steps for conducting any rescue work as per Mine Rescue Rule (MRR).
- State the importance of sensitization towards different genders and persons



<p>with disabilities (PWD).</p> <ul style="list-style-type: none"> <li>● Discuss the importance of waste management, hazardous material safety, security rules and regulations.</li> <li>● Throw light on importance of water/material/energy conservation and management.</li> </ul>	
<p><b>Classroom Aids</b></p>	
<p>LCD Projector, Laptop/Computer with internet, White Board, Flip Chart, Markers, Trainer Chair &amp; Table, Demonstration Table, Pin Up Boards</p>	
<p><b>Tools, Equipment and Other Requirements</b></p>	
<p>Welding rod, power supply, welding metal, eye protector glass with cover, Burning elements Sample Helmet, gloves, harness, protective clothes, earplugs, goggles, nose mask, Safety shoes, Fire extinguisher, Types of log book, First Aid box, MCDR, MCR, Company's SOP; Diagrams showing quarries, overhangs, fencing, etc.; samples of different types of rocks to be encountered; Mines Act; "5-S" Charts; Daily, Weekly, Monthly Maintenance/Defect sheets; Systematic Support Plan (SSP); Systematic Support Rules (SSR); self-rescue apparatus; Line Diagram of Ventilation Circuit; Alcohol based sanitisers; self-rescue apparatus; Gas Detector, Safety Lamp, Self-Contained Breathing Apparatus, gum boots; Diagrams of Armoured face conveyor; Charts of coal mines occupational diseases; CMR; MRR, Company's Safety Management Plan (SMP) and Emergency Management Plan (EMP);</p>	

## Module 8: Special preparation for Welding at U/G Mines

Mapped to MIN/N3204, v1.0

### Terminal Outcomes:

- Describe Special preparation for first, second and third-degree gassy mines

Duration:10:00	Duration:10:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> <li>Explain the job-specific documents e.g. daily maintenance checklist and importance of the same.</li> <li>Throw light on how to take permission in writing from manager before going for welding works at U/G mines.</li> <li>Discuss the risk and impact of not following defined procedures/work instructions.</li> <li>Explain how to carry out the welding work as per the SOP.</li> <li>Discuss the CMR and MMR regulation related to welding and cutting work.</li> <li>Explain how to do the pre-inspection of site relating to safety aspects/arrangement i.e. presence of methane, availability of firefighting equipment, site/plan preferences where welding is to be carried out.</li> <li>Outline the the hierarchy for reporting identified problems.</li> <li>Discuss the precaution taken during welding and cutting operation at U/G mines.</li> <li>Discuss the impact of damaged equipment on the company.</li> <li>Describe how to carry out post inspection of site relating to safety.</li> <li>Cite the implications of delays in the process.</li> <li>Explain how to ensure that the pieces which are not as per requirement and not meeting the specified standard and cannot be repaired are discarded.</li> <li>Describe the importance of first aid and hygiene.</li> <li>Throw light on how to ensure prior</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate how to perform welding and cutting with close supervision of authorized supervisor.</li> <li>Display how to use measurement instruments like rulers, Vernier callipers, and micrometers, weighing scale, gauges and other inspection equipment.</li> </ul>

<p>permission from regional inspector of mines before conducting any welding works in U/G mines.</p> <ul style="list-style-type: none"> <li>● State the code of practice in specific areas of the mine.</li> <li>● Discuss the standing orders in force at the mine.</li> <li>● Recall the duties of workmen under the Mines Act-1952.</li> <li>● Discuss the provision of compensation and working hours, leaves, etc. as per Mines Act-1952.</li> <li>● Explain about shot-firing / blasting related safety regulations including taking shelter during blasting.</li> <li>● Shed light on the guidelines to identify quality defects in work pieces -visual/ test based.</li> <li>● Discuss the methods used for cutting, shearing, hammering, and drilling which can repair pieces with minor defects.</li> <li>● List the basic level maintenance and cleaning techniques.</li> <li>● Enlist various solvents, chemicals, lubricants etc used during the maintenance processes.</li> <li>● Explain the procedure for arranging the equipment in the prescribed manner including tagging and numbering of machine parts.</li> <li>● State the safety precautions to be taken during cleaning and maintenance activities.</li> <li>● Cite the basic welding defects and corrective measures.</li> <li>● Discuss the basic level operations of lifting equipment like hoists, cranes, pulley etc.</li> </ul>	
<p><b>Classroom Aids</b></p>	
<p>LCD Projector, Laptop/Computer with internet, White Board, Flip Chart, Markers</p>	
<p><b>Tools, Equipment and Other Requirements</b></p>	
<p>Welding rod, power supply, welding metal, eye protector glass with cover, Burning elements Sample Helmet, gloves, harness, protective clothes, earplugs, goggles, nose mask, Safety shoes, Fire extinguisher, Types of log book, First Aid box, chippers, grinders, flux, filler material, welding gases, electrodes, jigs, welding gun, welding transformer, gas cylinders, hoist, lifts, crane</p>	

## Annexure

### Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
Class X	NA	6	Relevant experience required in Mine Welder	NA	-	-
OR						
ITI	Mechanical Engineering	6	Relevant experience required in Mine Welder	NA	-	-
OR						
Diploma	Mechanical Engineering	5	Relevant experience required in Mine Welder	NA	-	-
OR						
B-Tech	Mechanical Engineering	4	Relevant experience required in Mine Welder	NA	-	-
OR						
CITS-NCIC	Welder	1	Relevant experience in mining	NA	-	-

Trainer Certification	
Domain Certification	Platform Certification
<b>MIN/Q3201, v2.0</b> Mine Welder. Minimum accepted score as per SSC guideline is 80%.	<b>MEP/Q2601, v2.0</b> Trainer (VET and Skills). Minimum accepted score as per SSC guideline is 80%.

## Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training /Assessment Experience		Remarks
		Years	Specialization	Years	Specialization	
Class X	NA	8	Relevant experience required in Mine Welder	NA	-	-
OR						
ITI	Mechanical Engineering	8	Relevant experience required in Mine Welder.	NA	-	-
OR						
Diploma	Mechanical Engineering	7	Relevant experience required in Mine Welder	NA	-	-
OR						
B-Tech	Mechanical Engineering	6	Relevant experience required in Mine Welder	NA	-	-
OR						
CITS-NCIC	Welder	1	Relevant experience in mining	NA	-	-

Assessor Certification	
Domain Certification	Platform Certification
MIN/Q3201, v2.0 Mine Welder. Minimum accepted score as per SSC guideline is 80%.	MEP/Q2701, v2.0 Assessor (VET and Skills). Minimum accepted score as per SSC guideline is 80%.



## Assessment

## Strategy

### Assessment system Overview:-

Assessment will be carried out by SCMS affiliated assessment partners. Based on the results of assessment, SCMS certifies the learners. Candidates have to pass online theoretical assessment which is approved by SCMS.

The assessment will have both theory and practical components in 30:70 ratio.

While theory assessment is summative and an online written exam; practical will involve demonstrations of applications and presentations of procedures and other components. Practical assessment will also be summative in nature.

### Testing Environment:-

Training partner has to share the batch start date and end date, number of trainees and the job role.

Assessment is fixed for a day after the end date of training. It could be next day or later. Assessment will be conducted at the training venue.

Question bank of theory and practical will be prepared by assessment agency and approved by SCMS. From this set of questions, assessment agency will prepare the question paper. Theory testing will include multiple choice questions, pictorial question, etc. which will test the trainee on theoretical knowledge of the subject.

The theory and practical assessments will be carried out on same day. If number of candidates is many, more assessors and venue will be organized on same day of the assessment.

Assessment			
Assessment Type	Formative or Summative	Strategies	Examples
Theory	Summative	Written Examination	Knowledge of facts related to the job role and functions. Understanding of principles and concepts related to the job role and functions
Practical	Summative	Structured tasks	Presentation
Viva	Summative	Questioning and Probing	Mock interview on topics



### **Assessment Quality Assurance framework**

Only certified assessor can be assigned for conducting assessment. Provision of 100 % video recording with clear audio to be maintained and the same is to be submitted to SCMS.

The training partner will intimate the time of arrival of the assessor and time of leaving the venue.

### **Methods of Validation:-**

Unless the trainee is registered, the person cannot undergo assessment. To further ensure that the person registered is the person appearing for assessment, id verification will be carried out. Aadhar card number is required of registering the candidate for training. This will form the basis of further verification during the assessment. Assessor conducts the assessment in accordance with the assessment guidelines and question bank as per the job role. The assessor carries tablet with the loaded questions. This tablet is geotagged and so it is monitored to check their arrival and completion of assessment. Video of the practical session is prepared and submitted to SCMS. Random spot checks/audit is conducted by SCMS assigned persons to check the quality of assessment. Assessment agency will be responsible to put details in SIP.

SCMS will also validate the data and result received from the assessment agency.

### **Method of assessment documentation and access**

The assessment agency will upload the result of assessment in the portal. The data will not be accessible for change by the assessment agency after the upload. The assessment data will be validated by SCMS assessment team. After upload, only SCMS can access this data. SCMS approves the results within a week and uploads on SIP

## References

### Glossary

Term	Description
<b>Declarative Knowledge</b>	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
<b>Key Learning Outcome</b>	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
<b>OJT (M)</b>	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
<b>OJT (R)</b>	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
<b>Procedural Knowledge</b>	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
<b>Training Outcome</b>	Training outcome is a statement of what a learner will know, understand and be able to do <b>upon the completion of the training.</b>
<b>Terminal Outcome</b>	Terminal outcome is a statement of what a learner will know, understand and be able to do <b>upon the completion of a module.</b> A set of terminal outcomes help to achieve the training outcome.

### Acronyms and Abbreviations

Term	Description
<b>QP</b>	Qualification Pack
<b>NSQF</b>	National Skills Qualification Framework
<b>NSQC</b>	National Skills Qualification Committee
<b>NOS</b>	National Occupational Standards
<b>RE</b>	Rare Earths
<b>SIP</b>	Skill India Portal
<b>SOP</b>	Standard Operating Procedure
<b>SCMS</b>	Skill Council for Mining Sector