

# Model Curriculum

## 4. MIG/MAG/GMAW Welder

**SECTOR:** CAPITAL GOODS  
**SUB-SECTOR:** MACHINE TOOLS, DIES, MOULDS AND  
PRESS TOOLS, PLASTICS MANUFACTURING  
MACHINERY, TEXTILE MANUFACTURING  
MACHINERY, PROCESS PLANT MACHINERY,  
ELECTRICAL AND POWER MACHINERY,  
LIGHT ENGINEERING GOODS

**OCCUPATION:** WELDING AND CUTTING  
**REF ID:** CSC/Q0209, V1.0  
**NSQF LEVEL:** 4



## Certificate

### CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

**CAPITAL GOODS SKILL COUNCIL**

for the

**MODEL CURRICULAM**

Complying to National Occupational Standards of  
Job Role/ Qualification Pack: '**MIG/MAG/GMAW Welder**' QP No. '**CSC/ Qo2og NSQF Level 4**'

Date of Issuance: July 12<sup>th</sup>, 2016

Valid up to : Aug 30<sup>th</sup>, 2016

\*Valid up to the next review date of the Qualification Pack or the  
Valid up to date mentioned above (whichever is earlier)



Authorised Signatory  
(Capital Goods Skills Council)

## Table of Contents

1. Curriculum .....	1
2. Trainer Prerequisites.....	14
3. Annexure: Assessment Criteria .....	15

# MIG/MAG/GMAW Welder

## CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “MIG/MAG/GMAW Welder”, in the “Capital Goods” Sector/Industry and aims at building the following key competencies amongst the learner

<b>Program Name</b>	<b>MIG/MAG/GMAW Welder</b>		
<b>Qualification Pack Name &amp; Reference ID. ID</b>	CSC/Q0209, v1.0		
<b>Version No.</b>	1.0	<b>Version Update Date</b>	
<b>Pre-requisites to Training</b>	10th Standard passed		
<b>Training Outcomes</b>	<p><b>After completing this programme, participants will be able to:</b></p> <ul style="list-style-type: none"> <li>• <b>Work safely:</b> understand the importance of safe working practices at workplace, and comply with health and safety legislation, regulations and other guidelines</li> <li>• <b>Make joints using MIG/ MAG (GMAW) welding process:</b> identify accessories of MIG/ MAG welding setup and perform welding operation using MIG/ MAG welding technique as per the standard specification</li> <li>• <b>Manually weld metal and metal alloys using metal arc:</b> perform welding operation on metal and metal alloys using arc welding technique</li> <li>• <b>Manually cut metal and metal alloys using oxy fuel gas:</b> cut metals and metal alloys using oxy fuel cutting technique, and produce cuts of required dimension and quality</li> <li>• <b>Manually cut materials using plasma arc:</b> cut metals and metal alloys using plasma arc technique and produce cuts of the required dimensions</li> <li>• <b>Basic health and safety practices at workplace:</b> identify job site hazards at the work place and apply good housekeeping practices, use required Personal Protective Equipment</li> <li>• <b>Work effectively with others:</b> effectively communicate with others and demonstrate good ethical practices and discipline</li> </ul>		

This course encompasses 6 out of 6 National Occupational Standards (NOS) of “MIG/MAG/GMAW Welder” Qualification Pack issued by “Capital Goods Skill Council”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<p><b>Introduction</b></p> <p><b>Theory Duration</b> (hh:mm) 08:00</p> <p><b>Practical Duration</b> (hh:mm) 00:00</p> <p><b>Corresponding NOS Code</b> Bridge Module</p>	<ul style="list-style-type: none"> <li>State the various opportunities available in fabrication industry</li> <li>Identify the difference between MIG welding &amp; MAG welding w.r.t. gas used for shielding</li> <li>Describe the role and responsibilities of a MIG/ MAG/ GMAW Welder</li> <li>Compare &amp; identify different types of joints used in the fabrication industry such as fillet joint, butt joint, lap joint, corner joint, TEE joint, edge joint</li> <li>List various types of welding processes used in the industry</li> <li>Classify materials and explain their properties</li> <li>Classify steel and state important steel properties</li> <li>List advantages and disadvantages of various metal joining methods</li> <li>Explain the principle of metal arc welding, MIG/MAG welding ,Oxy fuel gas cutting and plasma arc cutting processes</li> </ul>	<p>Training Kit (PowerPoint, Trainer Guide)</p>
2	<p><b>Work safely</b></p> <p><b>Theory Duration</b> (hh:mm) 06:00</p> <p><b>Practical Duration</b> (hh:mm) 12:00</p> <p><b>Corresponding NOS Code</b> CSC/N0209</p>	<ul style="list-style-type: none"> <li>Explain the importance of safe working practices</li> <li>Comply with health and safety legislation, regulations and other guidelines</li> <li>Follow general safety practices at workplace</li> <li>Identify hazards at workplace and take corrective actions to avoid such hazards</li> <li>Follow the approved procedure for material handling</li> <li>State the causes of fire and apply approved methods to control fire accidents</li> <li>List the personal protective equipment (PPE) required for MIG/ MAG welding process</li> <li>Wear suggested PPE correctly</li> <li>Follow safety recommendations while using MIG/ MAG welding equipment</li> </ul>	<p>Training kit (Trainer guide, PowerPoint)</p> <p>Leather apron; leather gloves; welding screen – helmet type; hand screen welding; safety shoes; fire extinguisher - dry powder type, fire bucket with sand and first aid kit</p>
3	<p><b>Prepare for welding operations</b></p> <p><b>Theory Duration</b> (hh:mm) 08:00</p>	<ul style="list-style-type: none"> <li>Explain methods / modes of metal transfer like globular, short circuit transfer, spray arc, pulse and surface tension transfer</li> <li>List the factors that determine weld bead shape</li> <li>State the purpose and importance of pre</li> </ul>	<p>Training kit (Trainer guide, PowerPoint)</p> <p>Co2 welding machine complete 400 amps with gas cooled goose</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	<p><b>Practical Duration</b> (hh:mm) 10:00</p> <p><b>Corresponding NOS Code</b> CSC/N0209</p>	<p>heating requirement for base metal</p> <ul style="list-style-type: none"> <li>• Explain the cause for distortion and apply methods to control metal distortion during the welding</li> <li>• Read drawing and gather the specification of welding as per WPS</li> <li>• List welding positions as per EN-ISO 6947) –1G/PA, 2G/PC, 3g/PF &amp; PG, 4G/PE, 5g/PF &amp; PG, 6G/HLO45, 1F/PA, 2F/PB, 3F/PF &amp; PG, 4F/PD</li> <li>• List equipment and tools used in MIG/MAG welding and explain their function - welding power source with transport trolley and wheels, wire feeder unit, welding torch, remote control unit, gas regulators for (Ar + CO<sub>2</sub>) gas mixture or CO<sub>2</sub> gas, CO<sub>2</sub> gas pressure regulator, flow meter, heater unit, set of inter-connecting cables/ hoses with quick-fix end couplings, consumables and spares for welding torch</li> <li>• Classify power source as 'constant voltage supply' and 'constant current supply', list advantages and disadvantages of each type of power source</li> <li>• Identify critical parameters that define weld quality, like wire feed rate, electrode diameter, current, voltage and flow rate</li> <li>• Explain the necessity for shielding gases and properties of shielding gases (Argon and CO<sub>2</sub> – Combination of Argon and CO<sub>2</sub>)</li> <li>• Explain the meaning and impact of basic electrical terms, like current, voltage, polarity and inductance</li> <li>• Select right sized contact tip and liner</li> <li>• Select the wire diameter and composition based on the thickness and composition of metal to be welded</li> <li>• Demonstrate the method of arc generation- scratch, high frequency and lift start</li> <li>• Prepare the welding surface and joint based on the requirement of surface and joints. Ensure that the surface is free from rust or oil</li> <li>• Follow general maintenance of wire feeder and torch tip</li> <li>• Set welding parameters, like voltage, current, flow and wire feed rate based on the thickness and composition of the metal</li> </ul>	<p>necked torch 300 A; welding power source with transport trolley and wheels; wire feeder unit; welding torch; remote control unit; gas regulators for (Ar + CO<sub>2</sub>) gas mixture or CO<sub>2</sub> gas, CO<sub>2</sub> gas pressure regulator; flow-meter and heater unit; set of inter-connecting cables/ hoses with quick-fix end couplings; measuring tools; marking tools; hammers; chamfering machine; gas and plasma cutting; grinding and stripping; c clamps and jigs and fixtures.</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<ul style="list-style-type: none"> <li>Tack weld at suitable intervals and check for accuracy before final welding</li> <li>State the possible defects and take remedial actions to avoid such defects</li> <li>Visually inspect the weld for defects - poor fusion, undercut, porosity, slag inclusion and spatter.</li> </ul>	
4	<p><b>Carryout welding operation and test for accuracy</b></p> <p><b>Theory Duration</b> (hh:mm) 05:00</p> <p><b>Practical Duration</b> (hh:mm) 45:00</p> <p><b>Corresponding NOS Code</b> CSC/N0209</p>	<ul style="list-style-type: none"> <li>Explain the weld quality equivalent to Level C of ISO 5817</li> <li>Carry out fillet welding operation on ferrous and non-ferrous metals on sheet (&lt;1.5mm), plate, structural section, pipe/tube and other forms flat (PA) IG/1F, horizontal vertical (PB) 2F, horizontal (PC) 2G, vertical upwards (PF) 3F/3G, vertical downwards (PG) 3F/3G, plate to pipe (fixed) 5F</li> <li>Visually inspect welded joint for any defects</li> <li>Use appropriate tool to measure dimensional accuracy</li> <li>Prepare for DPT test to identify any discontinuity in the fillet welded joint</li> <li>Carryout Radiographic test for the butt welded joint to check the weld soundness</li> </ul>	<p>Training kit (Trainer guide, PowerPoint) Co2 welding machine complete 400 amps with gas cooled goose necked torch 300 A; welding power source with transport trolley and wheels; wire feeder unit; welding torch; remote control unit; gas regulators for (Ar + CO2) gas mixture or CO2 gas, CO2 gas pressure regulator; flow-meter and heater unit; set of inter-connecting cables/ hoses with quick-fix end couplings; measuring tools; marking tools; hammers; chamfering machine; gas and plasma cutting; grinding and stripping; c clamps and jigs and fixtures.</p>
5	<p><b>Post welding activities</b></p> <p><b>Theory Duration</b> (hh:mm) 05:00</p> <p><b>Practical Duration</b> (hh:mm) 20:00</p> <p><b>Corresponding NOS Code</b> CSC/N0209</p>	<ul style="list-style-type: none"> <li>State the purpose of NDT (Non Destructive Testing) and DT (Destructive Testing)</li> <li>Perform Die Penetrant Test (DPT), Fluorescent Penetrant Test (FPT), Magnetic Particle Test (MPT) and Radiographic Test (RT)</li> <li>Perform Destructive tests like nick break test, bend test, tensile, sheer, fatigue and impact tests</li> <li>Follow standard procedure to store welded parts</li> </ul>	<p>Training kit (Trainer guide, PowerPoint)</p> <p>Dye penetrant test kit; magnetic particle inspection testing machine; ultrasonic flaw detector and impact testing machine</p>
6	<b>Deal with contingencies</b>	<ul style="list-style-type: none"> <li>Follow standard procedure and method</li> </ul>	Training kit (Trainer

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	<p><b>Theory Duration</b> (hh:mm) 05:00</p> <p><b>Practical Duration</b> (hh:mm) 10:00</p> <p><b>Corresponding NOS Code</b> CSC/N0209</p>	<p>to detect any malfunctioning of the system</p> <ul style="list-style-type: none"> <li>Communicate system fault to the concerned authority, if any</li> <li>Seek guidance from the supervisor in case of any defects or malfunctioning of the system</li> <li>Read and interpret information correctly</li> <li>Fill appropriate forms</li> <li>Perform numerical calculations</li> <li>Participate in on-the-job learning, training and development, interventions and assessments</li> <li>Use problem solving skills</li> <li>Understand the importance of planning and organising day-to-day activities</li> <li>Understand importance of team work</li> </ul>	<p>guide, PowerPoint)</p>
7	<p><b>Work safely-Arc welding</b></p> <p><b>Theory Duration</b> (hh:mm) 02:00</p> <p><b>Practical Duration</b> (hh:mm) 02:00</p> <p><b>Corresponding NOS Code</b> CSC/N0204</p>	<ul style="list-style-type: none"> <li>Identify hazards at workplace and take corrective actions to avoid such hazards</li> <li>List the PPE required for arc welding process</li> <li>Follow relevant safety regulations applicable to country of work</li> <li>Wear the suggested PPE</li> <li>Understand and follow the safety recommendations while using arc welding equipment</li> </ul>	<p>Training kit (Trainer guide, PowerPoint)</p> <p>Leather gloves; leather apron; welding screen - helmet type; hand screen welding; safety shoes; fire extinguishers - dry powder fire extinguisher, fire bucket with sand and first aid kit</p>
8	<p><b>Prepare for welding operation</b></p> <p><b>Theory Duration</b> (hh:mm) 06:00</p> <p><b>Practical Duration</b> (hh:mm) 25:00</p> <p><b>Corresponding NOS Code</b> CSC/N0204</p>	<ul style="list-style-type: none"> <li>Read work instructions from Welding Procedure Specification (WPS)</li> <li>Explain welding positions as per ISO 6947 &amp; ASME Section IX</li> <li>Interpret flat, horizontal, vertical and overhead positions</li> <li>Explain the factors that determine weld bead shape - electrode angle, welding technique, arc length, thickness of base metal, travel speed</li> <li>Explain the meaning and impact of basic electrical terms - current, voltage, polarity and inductance</li> <li>List tools and equipment used in arc welding - Welding transformer set 300 A, arc welding set rectifier type, 400 amps, weld measuring gauge - fillet and butt, electrode holder - 400 amps, welding cable to carry 400 amps with flexible</li> </ul>	<p>Training kit</p> <p>PPE; welding transformer set with all accessories - 300 A; arc welding set rectifier type; 400 amps; weld measuring gauge - fillet and butt; electrode holder - 400 amps; welding cable to carry 400 amps with flexible rubber; cable lugs; earth clamps; arc welding positioner - rotary type; chipping tools; wire</p>



Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<p>rubber, cable lugs, earth clamps, arc welding positioner - rotary type, marking tools, chipping tools, measuring tools</p> <ul style="list-style-type: none"> <li>• Select welding machines such as inverters, rectifiers and generators, according to the task</li> <li>• Classify steels based on the carbon percentage and alloying elements</li> <li>• Prepare material and joint for welding using required hand tools</li> <li>• Carry out welding adjustments like current and voltage as per base metal thickness</li> <li>• State the importance of process parameters - electrode angle, speed, arc length, etc.,</li> <li>• Explain the cause for distortion and apply distortion control methods</li> <li>• Classify electrodes based on the diameter and composition of the base metal to be welded</li> <li>• Select electrode taking into consideration base metal composition and thickness</li> <li>• Connect accessories cables, electrode holders, return leads and clamps</li> <li>• Set welding parameters - voltage and current</li> <li>• Define welding methods, like drag, weave and chip</li> <li>• Verify setup by running test weld specimen</li> </ul>	brush and measuring tools
9	<p><b>Carryout welding operation and test for accuracy</b></p> <p><b>Theory Duration</b> (hh:mm) 05:00</p> <p><b>Practical Duration</b> (hh:mm) 40:00</p> <p><b>Corresponding NOS Code</b> CSC/N0204</p>	<ul style="list-style-type: none"> <li>• Generate and maintain a stable arc</li> <li>• Apply stop and restart technique properly to avoid welding defects</li> <li>• Carry out fillet welding in 1G/1F and 2G/2F position</li> <li>• Remove slag using wire brush and chip hammer</li> <li>• Explain the causes for defects and take remedial action to avoid such errors</li> <li>• Visually inspect the weld for lack of continuity, uneven or ripple formation, excessive spatter, burn through, undercutting, overlap, inclusions, porosity, cracks, lack of fusion or incomplete fusion, sharp edges and excessive convexity</li> <li>• Check all dimensional and geometrical aspects of the weld as per instructions</li> <li>• Check the length of fillet using fillet gauge</li> <li>• Seek help and guidance from the relevant authority</li> </ul>	Same as above

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<ul style="list-style-type: none"> <li>Shut down the welding equipment safely</li> <li>Keep the tools and equipment at identified location after work is complete</li> <li>Communicate with supervisors regarding the defects, if any</li> <li>Read and interpret information correctly</li> <li>Fill appropriate forms</li> <li>Perform numerical calculations</li> <li>Participate in on-the-job learning, training and development, interventions and assessments</li> <li>Use problem solving skills</li> <li>State the importance of planning and organising day-to-day activities</li> <li>Explain the importance of team work</li> </ul>	
10	<p><b>Work safely</b></p> <p><b>Theory Duration</b> (hh:mm) 02:00</p> <p><b>Practical Duration</b> (hh:mm) 02:00</p> <p><b>Corresponding NOS Code</b> CSC/N0203</p>	<ul style="list-style-type: none"> <li>Explain the importance of safe working practices</li> <li>Comply with health and safety legislation, regulations and other guidelines</li> <li>Follow general safety practices at workplace</li> <li>Identify hazards at the workplace and take corrective actions to avoid such hazards</li> <li>Follow the stated procedure to lift heavy objects and material handling</li> <li>State the causes of fire and apply the method to control fire accidents</li> <li>List the PPE required for gas cutting operation</li> <li>Wear the suggested PPE correctly</li> <li>Follow safety recommendations while handling oxy fuel gas setup</li> </ul>	<p>Training kit (Trainer guide, PowerPoint)</p> <p>Leather apron; leather gloves; welding screen – helmet type; hand screen welding; safety shoes; fire extinguisher - dry powder type; fire bucket with sand and first aid kit</p>
11	<p><b>Prepare for cutting operation</b></p> <p><b>Theory Duration</b> (hh:mm) 10:00</p> <p><b>Practical Duration</b> (hh:mm) 20:00</p> <p><b>Corresponding NOS Code</b> CSC/N0203</p>	<ul style="list-style-type: none"> <li>Read drawings to interpret the specification and cutting procedure</li> <li>Identify oxy fuel gas set up, accessories and their functions Identify the colour coding of oxygen and acetylene cylinders</li> <li>Connect accessories to oxygen and acetylene cylinders</li> <li>Identify right sized nozzle, and connect to the torch</li> <li>Check for any leakages in the system. Use of soap solution to detect acetylene leakage and fresh water for oxygen leakage</li> <li>Operate pressure regulators and set correct pressure for oxygen and acetylene</li> <li>State the purpose of cutting aids like spade guide, small circle cutting attachment, radius guide, circle cutting attachment, bevel guide</li> </ul>	<p>Training kit (Trainer guide, PowerPoint)</p> <p>Oxygen cylinder - 7m<sup>3</sup>; acetylene cylinder - 6 m<sup>3</sup>; oxygen pressure regulator; acetylene pressure regulator; flashback arrestors; cutting torch; rubber hoses; cutting nozzles; trolley to secure oxygen and acetylene cylinders; chain to secure oxygen and acetylene cylinders;</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<ul style="list-style-type: none"> <li>Identify various types of flames and their application</li> <li>Generate neutral flame i.e. balanced flame, oxidizing flame (excess oxygen) and carburizing flame (excess acetylene) by varying oxygen supply</li> <li>Carry out gas cutting using neutral flame on a test piece</li> <li>Use tools required for gas cutting operation</li> <li>Prepare work area by cleaning the table and organising all the required tools and equipment</li> </ul>	lighter/ flint; spanner set; spindle key; non-return valves; spade guides; radius guide; bevel guide; gas welding/ cutting table 822 cm x 92 cm x 60 cm; surface plate; scribe - 15 cm; dividers 20 cm; calliper outside 15 cm; prick punch; chisel cold flat - 19 mm; centre punch - 9 mm x 127 mm; rule 60 cm; two fold; brass topped to read inches and mm; hammer scaling 0.25 kg with handle; steel rule - 30 cm - to read inch and millimetre; Vernier calliper - digital - 0-150 mm; ball peen hammer with handle - 0.25 kg; cross peen hammer with handle - 0.25 kg; holding tongs - 30 cm; wire brush - 15 cm x 3.7 cm and double ended spanner hand held oxy fuel gas cutting equipment
12	<b>Carryout cutting operation and test for accuracy</b>  <b>Theory Duration</b> (hh:mm) 10:00  <b>Practical Duration</b> (hh:mm) 20:00	<ul style="list-style-type: none"> <li>Read the drawing to choose the procedure and cutting tolerance</li> <li>Select the right sized tip based on the plate thickness</li> <li>Check connection of accessories, and ensure that there is no gas leakage in the system</li> <li>Perform cutting operation on sheet/ pipe/ tube/ bar/ rod as per the drawing which may include Cutting operations: down-hand straight cuts (freehand), making straight cuts (track guided), cutting</li> </ul>	As mentioned above

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	<p><b>Corresponding NOS Code</b> CSC/N0203</p>	<p>regular shapes, cutting irregular shapes, making angled cuts, cutting chamfers, making radial cuts, gouging/flushing, bevelled edge – weld preparations, cutting out holes</p> <ul style="list-style-type: none"> <li>• Produce thermal cuts in various forms of material (3 mm and above)</li> <li>• Produce cut profiles on a range of materials including mild steel, high tensile and special steels and other forms – forms to include – plate, rolled section, pipe/tube and solid bars</li> <li>• Explain the possible defects that may occur, and take corrective action</li> <li>• Remove slag</li> <li>• Measure the cut part for accuracy. The accuracy should be within + 2 mm</li> </ul>	
13	<p><b>Deal with contingencies</b></p> <p><b>Theory Duration</b> (hh:mm) 06:00</p> <p><b>Practical Duration</b> (hh:mm) 10:00</p> <p><b>Corresponding NOS Code</b> CSC/N0203</p>	<ul style="list-style-type: none"> <li>• Communicate with superiors regarding malfunctioning of any component in the system</li> <li>• Seek assistance from superiors in case of any difficulty</li> <li>• Take necessary actions in case of following emergencies: <ul style="list-style-type: none"> <li>• contact with heat, sparks, molten metal or direct contact</li> <li>• fire/ explosion caused by gas leaks</li> </ul> </li> <li>• Sustained back fire in blow pipe</li> <li>• Read and interpret information correctly</li> <li>• Fill appropriate forms</li> <li>• Perform numerical calculations</li> <li>• Participate in on-the-job learning, training and development, interventions and assessments</li> <li>• Use problem solving skills</li> <li>• State the importance of planning and organising day-to-day activities</li> <li>• Explain the importance of team work</li> </ul>	
14	<p><b>Work safely</b></p> <p><b>Theory Duration</b> (hh:mm) 02:00</p> <p><b>Practical Duration</b> (hh:mm) 02:00</p> <p><b>Corresponding NOS</b></p>	<ul style="list-style-type: none"> <li>• Identify hazards at the workplace, and take corrective actions to avoid such hazards</li> <li>• List the PPE required for plasma arc cutting</li> <li>• Wear the suggested PPE correctly</li> <li>• Follow safety recommendations while using plasma arc cutting equipment</li> </ul>	<p>Training kit (Trainer guide + PowerPoint)</p> <p>Leather gloves; leather apron; welding screen - helmet type; hand screen welding; safety shoes; fire extinguishers - dry powder fire extinguisher; fire bucket with sand and first aid kit</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	<b>Code</b> CSC/N0207		
15	<p><b>Prepare for cutting operation</b></p> <p><b>Theory Duration</b> (hh:mm) 10:00</p> <p><b>Practical Duration</b> (hh:mm) 30:00</p> <p><b>Corresponding NOS Code</b> CSC/N0207</p>	<ul style="list-style-type: none"> <li>Read drawings to interpret specification and cutting procedure</li> <li>List and identify power source and accessories of plasma arc cutting machine</li> <li>Connect accessories to the power source</li> <li>Identify right sized tip and connect to the torch</li> <li>Check for leakages in the system as recommended by the manufacturer, if any</li> <li>Operate pressure regulators and set correct pressure as per standard procedure</li> <li>Follow correct procedures to store gases</li> <li>Set amperage and gas pressure based on metal thickness, metal type and type of gas</li> <li>Carry out marking on the work piece when required</li> <li>Perform a trial cut and visually check for any defects</li> </ul>	<p>Training kit (Trainer guide + PowerPoint)</p> <p>Micro plasma welding machine - 25 ampere; plasma power source; pilot arc ignition system; torch; portable straight line cutter; profile cutting machine; air filter with regulator; burner; electrode; compressor; nozzle; electrode holder; contact tube; gas supply system; cooling system; earthing clamp; connecting leads and cable; air plasma cutting system with standard accessories and compressor</p>
16	<p><b>Carryout cutting operation and test accuracy</b></p> <p><b>Theory Duration</b> (hh:mm) 15:00</p> <p><b>Practical Duration</b> (hh:mm) 60:00</p> <p><b>Corresponding NOS Code</b> CSC/N0207</p>	<ul style="list-style-type: none"> <li>Explain cutting techniques - stand-off, circle cutting profile cutting, edge, stenting hole and piercing</li> <li>Carry out cutting operation as per the drawing and select correct angle and speed of travel</li> <li>perform various cutting operations correctly</li> <li>Cutting operations: down-hand straight cuts (freehand), making straight cuts (track guided), cutting regular shapes, cutting irregular shapes, making angled cuts, cutting chamfers, making radial cuts, gouging/flushing, bevelled edge – weld preparations, cutting out holes</li> <li>produce thermal cuts in various forms of material</li> <li>produce cut profiles for various type of materials</li> <li>Materials type: mild steel; high alloy steel; stainless steel; aluminium and its alloys; other appropriate metal</li> <li>Check dimensional accuracy of the cut part by using appropriate tools</li> </ul>	Same as above

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<ul style="list-style-type: none"> <li>Visually inspect the cut metal piece for any defects and take corrective action to avoid such defects</li> </ul>	
17	<p><b>Deal with contingencies</b></p> <p><b>Theory Duration</b> (hh:mm) 06:00</p> <p><b>Practical Duration</b> (hh:mm) 15:00</p> <p><b>Corresponding NOS Code</b> CSC/N0207</p>	<ul style="list-style-type: none"> <li>Communicate with superiors regarding malfunctioning of any component in the system</li> <li>Seek assistance from superiors in case of any difficulty</li> <li>Follow standard operating procedure in case of emergency</li> <li>State relevant legislation, standards, policies and procedures followed in the organization</li> <li>Know the key purpose of the organization</li> <li>Know various departments and their functions</li> <li>Understand the work flow and own role in the work flow</li> <li>Understand hierarchy and protocols</li> <li>Read and interpret information correctly</li> <li>Fill appropriate forms</li> <li>Perform numerical calculations</li> <li>Participate in on-the-job learning, training and development, interventions and assessments</li> <li>Use problem solving skills</li> <li>State the importance of planning and organising day-to-day activities</li> <li>State the importance of self-management</li> <li>Explain the importance of team work</li> </ul>	Training kit (Trainer guide + PowerPoint)
18	<p><b>Health and safety</b></p> <p><b>Theory Duration</b> (hh:mm) 10:00</p> <p><b>Practical Duration</b> (hh:mm) 08:00</p> <p><b>Corresponding NOS Code</b> CSC/ N 1335</p>	<ul style="list-style-type: none"> <li>Explain the importance of PPE required for welding operation</li> <li>State the causes of accidents</li> <li>Identify job site hazardous work and state possible causes of risk or accident at the workplace</li> <li>Keep the work area clean and tidy. Ensure that the work area is free from hazards</li> <li>Check that the tools and equipment are in good working condition</li> <li>State the importance '5S' at workplace</li> </ul>	<p>Training kit (Trainer guide, PowerPoint)</p> <p>Leather gloves; leather apron; welding screen – helmet types; hand screen welding and, safety shoes</p>
19	<p><b>Fire safety</b></p> <p><b>Theory Duration</b> (hh:mm) 05:00</p> <p><b>Practical Duration</b></p>	<ul style="list-style-type: none"> <li>Explain the types of fires - Class A, B, C and D</li> <li>Select appropriate fire extinguisher to control the fire</li> <li>Use the PASS method to operate a fire extinguisher</li> <li>Follow fire safety signs and safe</li> </ul>	<p>Training kit (Trainer guide, PowerPoint)</p> <p>Class A, B, C, D and K fire extinguishers</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	(hh:mm) 30:00  <b>Corresponding NOS Code</b> CSC/ N 1335	<p>evacuation method in case of a fire</p> <ul style="list-style-type: none"> <li>Identify the location of assembly point, fire exit, and fire alarm</li> <li>Follow proper reporting procedure in case of a fire</li> </ul>	
20	<b>Emergencies, rescue and first aid procedure</b>  <b>Theory Duration</b> (hh:mm) 05:00  <b>Practical Duration</b> (hh:mm) 30:00  <b>Corresponding NOS Code</b> CSC/ N 1335	<ul style="list-style-type: none"> <li>Follow electrical safety procedures</li> <li>Explain the method to rescue a person from electrocution</li> <li>State the importance of first aid</li> <li>Identify the contents of a first aid kit and their application</li> <li>Administer first aid in case of bleeding, burns, choking, electrical shock, poisoning etc.</li> <li>Use CPR process</li> <li>Bandage wounds</li> <li>State the stages of crisis and crisis management</li> <li>Prepare an incident report</li> </ul>	<p>Training kit (Trainer guide, PowerPoint)</p> <p>First aid kit with all contents</p>
21	<b>Work effectively with others</b>  <b>Theory Duration</b> (hh:mm) 20:00  <b>Practical Duration</b> (hh:mm) 60:00  <b>Corresponding NOS Code</b> CSC/N 1336	<ul style="list-style-type: none"> <li>Explain the importance of team work and team dynamics</li> <li>State 4Cs of working in a team</li> <li>Maintain effective working relationship within own working group, line management and outside of the group</li> <li>State types of communication</li> <li>Apply effective communication technique</li> <li>Overcome barriers to effective communication</li> <li>Demonstrate active listening skills</li> </ul>	<p>Training kit (Trainer guide, PowerPoint)</p>
22	<b>Final Assessment</b>  <b>Theory Duration</b> (hh:mm) 04:00  <b>Practical Duration</b> (hh:mm) 06:00  <b>Corresponding NOS Code</b>	<ul style="list-style-type: none"> <li>To test skills and knowledge</li> </ul>	
	<b>Total Duration</b>	<b>Unique Equipment Required:</b> Gas cutting equipment with all accessories; gas welding/ cutting	

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	<p><b>Theory Duration</b> <b>159:00</b></p> <p><b>Practical Duration</b> <b>451:00</b></p>	<p>table 822 cm x 92 cm x 60 cm; welding transformer set with all accessories - 300 A, arc welding set rectifier type; 400 amps with all accessories; weld measuring gauge - fillet and butt; electrode holder - 400 amps; welding cable to carry 400 amps with flexible rubber; cable lugs; earth clamps; arc welding positioner - rotary type; Co2 welding machine complete 400 amps with gas cooled goose necked torch 300 A; welding power source with transport trolley and wheels; wire feeder unit; welding torch; remote control unit; gas regulators for (Ar + CO2) gas mixture or CO2 gas; set of inter-connecting cables/ hoses with quick-fix end couplings; micro plasma welding machine - 25 ampere; air plasma cutting system with standard accessories and compressor; dye penetrant test kit; magnetic particle inspection testing machine; ultrasonic flaw detector and impact testing machine</p> <p><b>General Tools</b></p> <p>Surface plate - standard size; scribe - 15 cm; dividers - 20 cm; calliper outside 15 cm; prick punch; chisel cold flat - 19 mm; centre punch - 9 mm x 127 mm; rule 60 cm; two fold; brass tooped to read inches and mm; hammer scaling 0.25 kg with handle; steel rule - 30 cm to read inch and millimetre; vernier calliper - digital - 0-150 mm; ball peen hammer with handle - 0.25 kg; cross peen hammer with handle - 0.25 kg; holding tongs - 30 cm; wire brush - 15 cm x 3.7 cm; double ended spanner - 6 mm to 15 mm; hacksaw frame with blade - adjustable 30 cm; hammer sledge double faced - 3 kg; bench vice - 10 cm jaw; power hacksaw; hand bench shear; capacity up to 5 mm; DE grinder; 30 cm wheel; motorized; pedestal type; file - half round; flat; bastard; file half round bastard - 30 cm; file flat rough - 35 cm; number punch; letter punch - 6 mm; clamps - 10 cm, 15 cm, 20 cm, 30 cm; pipe wrench 25 cm, 35 cm and tinman's square - 60 cm x 30 cm</p>	

Grand Total Course Duration: **610Hours, 0 Minutes**

*(This syllabus/ curriculum has been approved by [Capital Goods Skill Council](#))*



## Trainer Prerequisites for Job role: “MIG/MAG/GMAW Welder” mapped to Qualification Pack: “CSC/Q0209 v1.0”

Sr. No.	Area	Details
1	<b>Description</b>	Perform manual (semi-automatic) MIG/MAG (GMAW) welding for a range of standard welding job requirements and weld different materials (carbon steel, aluminium and stainless steel) in various positions. The welder can prepare various joints including corner, butt, fillet and tee. Set-up and prepare for operations interpreting the right information from the WPS.
2	<b>Personal Attributes</b>	Basic communication, numerical and computational abilities. Openness to learning, ability to plan and organize own work and identify and solve problems in the course of working. Understanding the need to take initiative and manage self and work to improve efficiency and effectiveness.
3	<b>Minimum Educational Qualifications</b>	Diploma /Degree in Mechanical Engineering
4a	<b>Domain Certification</b>	Certified for Job Role: “MIG/MAG/GMAW Welder” mapped to QP: “CSC/Q0209, v1.0”. Minimum accepted score is 80%
4b	<b>Platform Certification</b>	Recommended that the Trainer is certified for the Job Role: “Trainer”, mapped to the Qualification Pack: “SSC/Q1402”. Minimum accepted 70 % as per respective SSC guidelines is 70%.
5	<b>Experience</b>	<ul style="list-style-type: none"> <li>3-4 years of industry experience in the relevant field</li> <li>3-4 years of teaching experience</li> </ul>

## Annexure: Assessment Criteria

<b>Assessment Criteria</b>	
<b>Job Role</b>	<b>MIG/MAG/GMAW Welder</b>
<b>Qualification Pack</b>	<b>CSC/Q0209, v1.0</b>
<b>Sector Skill Council</b>	<b>Capital Goods Skill Council</b>

<b>Sr. No.</b>	<b>Guidelines for Assessment</b>
1	Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2	The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3	Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre(as per assessment criteria below)
4	Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criteria
5	To pass the Qualification Pack, every trainee should score a minimum of 60% in aggregate and 40% in each NOS
6	The marks are allocated PC wise; however, every NOS will carry a weight age in the total marks allocated to the specific QP

Assessable Outcome	Assessment Criteria	Total Mark (600)	Out Of	Marks Allocation	
				Theory	Skills Practical
<b>1.CSC/ N 0209 Manually (semi-automatic) welding joints using the MIG/MAG (GMAW) process</b>	PC1. work safely at all times, complying with health and safety legislation, regulations and other relevant guidelines	<b>100</b>	3	1	2
	PC2. take necessary safety precautions for MIG welding operations		2	0	2
	PC3. interpret weld procedure datasheets specifications, PQR and WPS		5	2	3
	PC4. select welding machines such as inverters, rectifiers and generators, according to the task		2	0	2
	PC5. select electrodes according to classification and specifications		3	1	2
	PC6. prepare the materials and joint in readiness for welding		2	0	2
	PC7. check the condition of, and correctly connect, welding leads/cables, hoses, shielding gas supply and wire feed mechanisms		3	1	2
	PC8. prepare the welding equipment for a range of given applications		2	1	1
	PC9. select the welding shielding gases and equipment for range of given applications		2	0	2
	PC10. plan the welding activities before they start them effectively and efficiently for achieving specifications as per WPS		2	0	2
	PC11. clean wire feeder and torch tip		2	1	1
	PC12. connect torches and components		2	0	2
	PC13. connect and adjust regulators and flow meters to cylinders		3	1	2
	PC14. adjust wire feed rate and read and set current as required		2	0	2
	PC15. set other welding parameters (eg. voltage, slope of current versus voltage curve where required)		3	1	2
	PC16. choose appropriate mode of metal transfer		2	1	1
	PC17. set pre-purge with shielding gas as required		3	1	2
	PC18. set and verify gas flow rates		3	1	2
	PC19. prepare and support the joint, using the appropriate methods		2	0	2
	PC20. tack weld the joint at appropriate intervals, and check the joint for accuracy before final welding		3	1	2
	PC21. use manual welding and related equipment, to carry out MIG/MAG welding processes		2	0	2
	PC22. perform MIG welding operations to meet		4	1	3

Assessable Outcome	Assessment Criteria	Total Mark (600)	Out Of	Marks Allocation	
				Theory	Skills Practical
	welding procedure specification requirements				
	PC23. adjust wire stick-out as per requirement		2	0	2
	PC24. use welding consumables appropriate to the material and application to DC current types		3	1	2
	PC25. produce joints of the required quality and of specified dimensional accuracy which achieve a weld quality equivalent to Level C of ISO 5817		4	1	3
	PC26. produce joints from various materials in different forms		3	0	3
	PC27. weld joints in good access situations, in select positions		3	1	2
	PC28. make sure that the work area is maintained and left in a safe and tidy condition		2	0	2
	PC29. identify various weld defects use appropriate methods and equipment to check the quality, and that all dimensional and geometrical aspects of the weld are to the specification		4	1	3
	PC30. check that the welded joint conforms to the specification, by checking various quality parameters by visual inspection		3	1	2
	PC31. detect surface imperfections and deal with them appropriately		3	1	2
	PC32. carry out DPT tests to assess fine defect open to the surface not detected by visual inspection (VT)		3	1	2
	PC33. assist in preparation for non-destructive testing of the welds, for a range of tests		3	1	2
	PC34. prepare for destructive tests on weld specimens for fillet, butt and corner		3	1	2
	PC35. shut down and make safe the welding equipment on completion of the welding activities		2	0	2
	PC36. detect equipment malfunctions and deal with them safely and as per organization procedures		3	1	2
	PC37. deal promptly and effectively with problems within own control, and seek timely and appropriate help and guidance from relevant personnel where required		2	1	1
	<b>Total</b>		<b>100</b>	<b>25</b>	<b>75</b>
<b>2.CSC/ N 0204 Manually weld metal and</b>	PC1. work safely at all times, complying with health and safety legislation, regulations and other relevant guidelines	<b>100</b>	3	1	2

Assessable Outcome	Assessment Criteria	Total Mark (600)	Out Of	Marks Allocation	
				Theory	Skills Practical
<b>metal alloys using metal arc</b>	PC2. adhere to procedures or systems in place for health and safety, personal protective equipment (PPE) and other relevant safety regulations		3	1	2
	PC3. check the condition of, and correctly connect, welding leads, earthing arrangements and electrode holder		2	0	2
	PC4. follow fume extraction safety procedures		3	1	2
	PC5. read and interpret routine information on written job instructions, welding procedure specifications and standard operating procedures		5	2	3
	PC6. select welding machines eg. transformers, rectifiers, inverters and generators, according to the task		3	1	2
	PC7. select electrodes according to classification and specifications		3	1	2
	PC8. prepare the work area for the welding activities		2	0	2
	PC9. performing measurements for joint preparation and routine MMAW		4	1	3
	PC10. prepare the materials and joint in readiness for welding		3	1	2
	PC11. use manual metal-arc welding and related equipment to include a. alternating current (AC) equipment b. direct current (DC) equipment		2	0	2
	PC12. connect equipment to power source		2	0	2
	PC13. connect cables, electrode holders, return leads and ground clamps to appropriate terminal		3	1	2
	PC14. re-dry electrodes as per electrode classification requirement		3	1	2
	PC15. set, read and adjust amperage controls		4	2	2
	PC16. tack weld the joint at appropriate intervals, and check the joint for accuracy before final welding		3	0	3
	PC17. verify set up by running test weld specimen (scrap plate)		2	1	1
	PC18. strike and maintain a stable arc		2	0	2
	PC19. stop and properly re-start arc to avoid welding defects (scratch start, tapping techniques)		2	0	2
	PC20. manipulate electrode angle using various methods as per WPS		3	1	2
	PC21. maintain constant puddle by using appropriate travel speed		3	1	2
	PC22. remove slag in an appropriate manner (eg. wire brush, hammer, etc.)		3	1	2

Assessable Outcome	Assessment Criteria	Total Mark (600)	Out Of	Marks Allocation	
				Theory	Skills Practical
	PC23. weld the joint to the specified quality, dimensions and profile applicable to range of material from 1.5 mm – 24 mm.		4	1	3
	PC24. produce range of welded joints to within the mentioned standard using single or multi-run welds (as appropriate)		3	1	2
	PC25. produce joints of the required quality and of specified dimensional accuracy which achieve a weld quality equivalent to Level C of ISO 5817		3	0	3
	PC26. produce range of welded joints in various positions as per the WPS specified		4	1	3
	PC27. produce joints using a range of materials		3	0	3
	PC28. identify various weld defects use appropriate methods and equipment to check the quality, and that all dimensional and geometrical aspects of the weld are to the specification		3	1	2
	PC29. check that the welded joint conforms to the specification, by checking various quality parameters by visual inspection		3	1	2
	PC30. detect surface imperfections and deal with them appropriately		2	0	2
	PC31. carry out DPT tests to assess fine defect open to the surface not detected by visual inspection (VT)		4	2	2
	PC32. assist in preparation for non-destructive testing of the welds, for a range of tests		2	0	2
	PC33. prepare for destructive tests on weld specimens for select tests		3	1	2
	PC34. shut down and make safe the welding equipment on completion of the welding activities		1	0	1
	PC35. deal promptly and effectively with problems within their control, and seek help and guidance from the relevant people if they have problems that they cannot resolve		2	0	2
	<b>Total</b>		<b>100</b>	<b>25</b>	<b>75</b>
<b>3.CSC/ N 0203 Manually cut metal and metal alloys using oxy-fuel gas</b>	PC1. work safely at all times, complying with health and safety legislation, regulations and other relevant guidelines	<b>100</b>	3	1	2
	PC2. take necessary safety precautions for gas cutting operations including equipment, processes and checks		3	1	2
	PC3. interpret cutting procedure datasheets specifications		3	1	2

Assessable Outcome	Assessment Criteria	Total Mark (600)	Out Of	Marks Allocation	
				Theory	Skills Practical
	PC4. check regulators, hoses and check that valves are securely connected and free from leaks and damage		2	0	2
	PC5. check equipment is calibrated and approved for use		2	0	2
	PC6. check/fit the correct size gas nozzle to the torch		2	0	2
	PC7. ensure preheat and oxygen holes on the tips are clean		2	0	2
	PC8. check that a flashback arrestor is fitted		2	0	2
	PC9. set appropriate gas pressures		2	0	2
	PC10. use the correct procedure for lighting, adjusting and extinguishing the flame		3	1	2
	PC11. adjust torch valve for type of flame such as neutral, carburizing and oxidizing		3	1	2
	PC12. follow sequence of operations such as pre-heating material and initiating cut		3	1	2
	PC13. mark out the locations for cutting accurately and as per requirement		3	1	2
	PC14. use appropriate and safe procedures for handling and storing of gas cylinders		3	1	2
	PC15. prepare the work area for the cutting activities		2	0	2
	PC16. obtain the appropriate tools and equipment for the oxy-fuel gas cutting operations, and check that they are in a safe and usable condition		2	0	2
	PC17. check that the oxy-fuel gas cutting equipment is set up for the operations to be performed		2	0	2
	PC18. adjust cylinder valves and adjust regulator for operating pressure to achieve specifications for required operations		3	1	2
	PC19. where appropriate, mark out the components for the required operations, using appropriate tools and techniques		2	0	2
	PC20. perform trial cut to check for cut defects		2	0	2
	PC21. operate the oxy-fuel gas cutting equipment to produce items/cut shapes to the dimensions and profiles specified		5	1	4
	PC22. use various types of oxy-fuel gas cutting methods		4	1	3
	PC23. perform various cutting operations correctly		4	1	3
	PC25. produce cut profiles for various type of materials		4	1	3

Assessable Outcome	Assessment Criteria	Total Mark (600)	Out Of	Marks Allocation	
				Theory	Skills Practical
	PC26. produce thermally-cut components which meet specified quality criteria leave		4	1	3
	PC27. recognize and correct burn back and flashback		3	1	2
	PC28. detect and correct defects in cut		3	1	2
	PC29. ensure the work area is left in a safe and tidy condition on completion of the cutting activities		2	0	2
	PC30. check that the finished components meet the standard required		3	1	2
	PC31. use appropriate methods and equipment to check the quality, and that all dimensional and geometrical aspects of the cut material are to the specification		3	1	2
	PC32. identify various cutting defects and follow organisation recommended procedures to address them		3	1	2
	PC33. report any difficulties or problems that may arise with the cutting activities, and carry out any agreed actions		3	1	2
	PC34. detect equipment malfunctions and deal with them appropriately		3	1	2
	PC35. deal promptly and effectively with problems within their control, and seek help and guidance from the relevant people if they have problems that they cannot resolve		2	0	2
	PC36. shut down and make safe the cutting equipment on completion of the cutting activities		3	1	2
	PC37. in case of emergencies follow standard emergency procedures		2	0	2
	<b>Total</b>		<b>100</b>	<b>22</b>	<b>78</b>
<b>4.CSC/ N 0207 Manually cut metal materials using plasma arc</b>	PC1. work safely at all times, complying with health	<b>100</b>	3	1	2
	PC2. take necessary safety precautions for plasma cutting operations including equipment, processes and checks		3	1	2
	PC3. interpret cutting procedure datasheets specifications		3	1	2
	PC4. check regulators, hoses and check that valves are securely connected and free from leaks and damage		3	1	2
	PC5. check equipment is calibrated and approved for use		2	0	2
	PC6. check/fit the correct nozzle to the torch		3	1	2



Assessable Outcome	Assessment Criteria	Total Mark (600)	Out Of	Marks Allocation	
				Theory	Skills Practical
	PC7. match correct tips and cups to the torch as per requirement and manufacturer's equipment instructions		2	0	2
	PC8. set the amperage and gas pressure as per metal thickness, metal type, and type of gas		2	0	2
	PC9. use the correct procedure for lighting, adjusting and extinguishing the arc		3	1	2
	PC10. use appropriate and safe procedures for handling and storing of gas cylinders		3	1	2
	PC11. prepare the work area for the cutting activities		3	1	2
	PC12. obtain the appropriate tools and equipment for the plasma arc cutting operations, and check that they are in a safe and usable condition		3	1	2
	PC13. check that the plasma arc cutting equipment is correctly set up for the operations to be performed		2	0	2
	PC13. check that the plasma arc cutting equipment is correctly set up for the operations to be performed		2	0	2
	PC14. carry out correct measurements required using appropriate equipment and methods for planning the cut		3	1	2
	PC15. where appropriate, mark out the components for the required operations, using appropriate tools and techniques		3	1	2
	PC16. perform trial cut to check for cut defects		3	1	2
	PC17. operate the plasma cutting equipment to produce items/cut shapes to the dimensions and profiles as specified		4	1	3
	PC18. use the correct angles to cut and the right speed		4	1	3
	PC19. use various types of plasma arc cutting methods/techniques		4	1	3
	PC20. perform various cutting operations correctly		4	1	3
	PC21. produce thermal cuts in various forms of material		4	1	3
	PC22. produce cut profiles for various type of materials		3	0	3
	PC23. produce thermally-cut components which meet specified quality criteria		4	1	3
	PC24. detect and correct defects in cut		3	1	2
	PC25. leave the work area in a safe and tidy condition on completion of the cutting activities		2	0	2

Assessable Outcome	Assessment Criteria	Total Mark (600)	Out Of	Marks Allocation	
				Theory	Skills Practical
	PC26. check that the finished components meet the required standard		3	1	2
	PC27. use appropriate methods and equipment to check the quality, and that all dimensional and geometrical aspects of the cut material are to the specification		4	2	2
	PC28. identify various cutting defects		3	1	2
	PC29. report any difficulties or problems that may arise with the cutting activities, and carry out any agreed actions		3	1	2
	PC30. detect equipment malfunctions and deal with them appropriately		2	0	2
	PC31. deal promptly and effectively with problems within their control, and seek help and guidance from the relevant people if they have problems that they cannot resolve		3	1	2
	PC32. shut down and make safe the cutting equipment on completion of the cutting activities or during an emergency		2	0	2
	PC33. in case of emergencies follow standard emergency procedures		2	0	2
	<b>Total</b>		<b>100</b>	<b>25</b>	<b>75</b>
<b>5.CSC/ N 1335</b> <b>Use basic health and safety practices at the workplace</b>	PC1. use protective clothing/equipment for specific tasks and work conditions		5	2	3
	PC2. state the name and location of people responsible for health and safety in the workplace		3	1	2
	PC3. state the names and location of documents that refer to health and safety in the workplace		3	1	2
	PC4. identify job-site hazardous work and state possible causes of risk or accident in the workplace		5	2	3
	PC5. carry out safe working practices while dealing with hazards to ensure the safety of self and others state methods of accident prevention in the work environment of the job role		4	2	2
	PC6. state location of general health and safety equipment in the workplace		3	2	1
	PC7. inspect for faults, set up and safely use steps and ladders in general use		5	2	3
	PC8. work safely in and around trenches, elevated places and confined areas		5	2	3
	PC9. lift heavy objects safely using correct procedures		5	2	3
	PC10. apply good housekeeping practices at all times		4	2	2

Assessable Outcome	Assessment Criteria	Total Mark (600)	Out Of	Marks Allocation	
				Theory	Skills Practical
	PC11. identify common hazard signs displayed in various areas		5	2	3
	PC12. retrieve and/or point out documents that refer to health and safety in the workplace		3	1	2
	PC13. use the various appropriate fire extinguishers on different types of fires correctly		4	1	3
	PC14. demonstrate rescue techniques applied during fire hazard		4	1	3
	PC15. demonstrate good housekeeping in order to prevent fire hazards		3	1	2
	PC16. demonstrate the correct use of a fire extinguisher		4	1	3
	PC17. demonstrate how to free a person from electrocution		4	1	3
	PC18. administer appropriate first aid to victims where required eg. in case of bleeding, burns, choking, electric shock, poisoning etc.		4	1	3
	PC19. demonstrate basic techniques of Bandaging		3	1	2
	PC20. respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments		4	1	3
	PC21. perform and organize loss minimization or rescue activity during an accident in real or simulated environments		3	1	2
	PC22. administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock, before the arrival of emergency services in real or simulated cases		3	1	2
	PC23. demonstrate the artificial respiration and the CPR Process		3	1	2
	PC24. participate in emergency procedures		3	2	1
	PC25. complete a written accident/incident report or dictate a report to another person, and send report to person responsible		4	1	3
	PC26. demonstrate correct method to move injured people and others during an emergency		4	1	3
	<b>Total</b>		<b>100</b>	<b>36</b>	<b>64</b>
<b>6.CSC/ N 1336 Work effectively with others</b>	PC1. accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required	<b>100</b>	10	3	7
	PC2. accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt		10	3	7
	PC3. give information to others clearly, at a pace and in a manner that helps them to understand		10	3	7

Assessable Outcome	Assessment Criteria	Total Mark (600)	Out Of	Marks Allocation	
				Theory	Skills Practical
	PC4. display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible		10	3	7
	PC5. consult with and assist others to maximize effectiveness and efficiency in carrying out tasks		10	3	7
	PC6. display appropriate communication etiquette while working		10	3	7
	PC7. display active listening skills while interacting with others at work		10	3	7
	PC8. use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism		10	3	7
	PC9. demonstrate responsible and disciplined behaviors at the workplace		10	3	7
	PC10. escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict		10	3	7
	<b>Total</b>		<b>100</b>	<b>30</b>	<b>70</b>
	<b>Grand Total</b>	<b>600</b>	<b>600</b>	<b>163</b>	<b>437</b>
	<b>Percentage Weightage:</b>			<b>27</b>	<b>73</b>
	<b>Minimum Pass% to qualify (aggregate):</b>			<b>60</b>	