

## **SYLLABUS - WELDER**

## **DURATION: ONE YEAR**

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Duration	Reference Learning Outcome	Process code	Professional Skills (Trade Practical) With Indicative Hrs.  Professional Knowledge (Trade Theory)				
Professional Skill 50 Hrs; Professional Knowledge 14 Hrs	Set the gas welding plant and join MS sheet in different position following safety precautions. [Different position: -1F, 2F, 3F, 1G, 2G, 3G.]  Set the SMAW machine and perform different type of joints on MS in different position observing standard procedure. [different types of joints- Fillet (T-joint, lap & Corner), Butt (Square & V); different position - 1F, 2F, 3F,4F, 1G, 2G, 3G, 4G]	OAW-01	1. Demonstration of Machinery used in the trade. (6 hrs.)  2. Identification to safety equipment and their use etc. (4 hrs.)  3. Hack sawing, filing square to dimensions. (7 hrs.)  4. Marking out on MS plate and punching. (8 hrs.)  5. Setting of oxy-acetylene welding equipment, Lighting and setting of flame. (5 hrs.)  6. Perform fusion run without filler rod on MS sheet 2mm thick in flat position. (5 hrs.)  1. Importance of Welding in Industry  - Elementary First Aid.  - Importance of Welding in Industry  - Safety precautions in Shielded Metal Arc  Welding, and Oxy-Acetylene Welding, and Oxy-Acetylene Welding and Cutting. (07 hrs)  - Introduction and definition of welding.  - Arc and Gas Welding Equipments, tools and accessories.  - Various Welding Processes and its applications.  - Arc and Gas Welding terms				
			<ul> <li>7. Setting up of Arc welding machine &amp; (07 hrs)</li> <li>8. Deposit straight line bead on MS plate in flat position. (10 hrs.)</li> </ul>				



Professional	Set the gas welding	OAW-02	9. Depositing bead with	- Different process of metal
Skill 25 Hrs;	plant and join MS		filler rod on M.S. sheet	joining methods: Bolting,
Professional	sheet in different position following		2 mm thick in flat position. (10 hrs.)	riveting, soldering, brazing, seaming etc.
Knowledge	safety precautions.		position. (10 ms.)	- Types of welding joints and
07 Hrs	[Different position: -	OAW-03	10. Edge joint on MS sheet	its applications. Edge
	1F, 2F, 3F, 1G, 2G,		2 mm thick in flat	preparation and fit up for
	3G.]		position without filler	different thickness.
			rod. (15 hrs.)	- Surface Cleaning
				(07 hrs)
Professional	Set the SMAW	SMAW-02	11. Straight line beads on	- Basic electricity applicable
Skill 25 Hrs;	machine and perform different type of joints		M.S. plate 10 mm thick in flat position. (10 hrs.)	to arc welding and related electrical terms
Professional	on MS in different		in hat position. (10 ms.)	&definitions.
Knowledge	position observing	SMAW-03	12. Weaved bead on M. S	- Heat and temperature and
07 Hrs	standard procedure.		plate 10mm thick in flat	its terms related to
	[different types of		position. (15 hrs.)	welding
	joints- Fillet (T-joint,			- Principle of arc welding.
	lap & Corner), Butt			And characteristics of arc.
	(Square & V); different position - 1F, 2F,			(07 hrs)
	3F,4F, 1G, 2G, 3G, 4G]			
Professional	Set the oxy- acetylene	OAGC-01	13. Setting up of oxy-	- Common gases used for
Skill 25 Hrs;	cutting plant and		acetylene and make	welding & cutting, flame
Professional	perform different		straight cuts (freehand)	temperatures and uses.
Knowledge	cutting operations on		(2 hrs.)	- Chemistry of oxy-acetylene
07 Hrs	MS plate. [Different	OAGC-02	14. Perform marking and	flame.
	cutting operation –		straight line cutting of	- Types of oxy-acetylene flames and uses.
	Straight, Bevel,		MS plate 10 mm thick	names and uses.



	circular]		by gas. Accuracy within ±2mm. (4 hrs.)	- Oxy-Acetylene Cutting Equipment principle,
		OAGC-03	15. Beveling of MS plates	parameters and
			10 mm thick, cutting	application.
			regular geometrical	(07 hrs)
			shapes and irregular	
			shapes, cutting	
			chamfers by gas cutting.	
			(7 hrs.)	
		OAGC-04	16. Circular gas cutting on	
			MS plate 10 mm thick	
			by profile cutting	
			machine.(7 hrs.)	
		OAGC-05	17. Marking and perform	
			radial cuts, cutting out	
			holes using oxy-	
			acetylene gas cutting.(3 hrs.)	
		OAGC-06	18. Identify cutting defects	
		OAGC-00	viz., distortion, grooved,	
			fluted or ragged cuts;	
			poor draglines; rounded	
			edges; tightly adhering	
			slag.(2 hrs.)	
Professional	Set the gas welding	OAW-04	19. Square butt joint on	- Arc welding power
Skill 150 Hrs;	plant and join MS		M.S. sheet 2 mm thick	sources: Transformer,
Professional	sheet in different		in flat Position. <b>(1G)</b> (9	Motor Generator set,
Knowledge	position following		hrs.)	Rectifier and Inverter type
42 Hrs	safety precautions.		20. Fillet "T" joint on M.S.	welding machines and its
72 1113	[Different position: -	SMAW-04	Plate 10 mm thick in flat	care & maintenance
	1F, 2F, 3F, 1G, 2G,		position. <b>(1F)</b> (7 hrs.)	- Advantages and
	3G.]		21. Open corner joint on	disadvantages of A.C. and
	C-t db CAAN	OAW-05	MS sheet 2 mm thick in	D.C. welding machines
	Set the SMAW	CNAANA/ OF	flat Position (1F)(9 hrs.)	(06 hrs)
	machine and perform	SMAW-05	22. Fillet lap joint on M.S.	- Welding positions as per
	different type of joints on MS in different		plate 10 mm thick in flat	EN &ASME: flat, horizontal,
	position observing	OAW-06	position. <b>(1F)</b> (7 hrs.) 23. Fillet "T" joint on MS	vertical and over head position.
	position observing	UAW-06	23. Fillet 1 Juliit Off MS	μυδιτίστι.



standard procedure.		sheet 2 mm thick in flat	- Weld slope and rotation.
[different types of		position. <b>(1F)</b> (7 hrs.)	- Welding symbols as per BIS
joints- Fillet ( T-joint,	SMAW-06	24. Open Corner joint on	& AWS. (06 hrs)
lap & Corner), Butt		MS plate 10 mm thick in	
(Square & V); different		flat position. (1F)(8 hrs.)	
position - 1F, 2F,	OAW-07	25. Fillet Lap joint on MS	- Arc length – types – effects
3F,4F, 1G, 2G, 3G, 4G]		sheet 2 mm thick in flat	of arc length.
		position <b>. (1F)</b> (08 hrs.)	- Polarity: Types and
	SMAW-07	26. Single "V" Butt joint on	applications.
		MS plate 12 mm thick in	- Weld quality inspection,
		flat position (1G). (11	common welding mistakes
		hrs.)	and appearance of good
	I&T-01	27. Testing of weld joints by	and defective welds
		visual inspection. (1 hr.)	- Weld gauges & its uses.
		28. Inspection of welds by	(06 hrs)
		using weld gauges. (1	
		hr.)	
	OAW-08	29. Square Butt joint on	- Calcium carbide properties
		M.S. sheet. 2 mm thick	and uses.
		in Horizontal position.	- Acetylene gas properties
		<b>(2G)</b> (8 hrs.)	and generating methods.
	SMAW-08	30. Straight line beads and	- Acetylene gas Purifier,
		multi layer practice on	Hydraulic back pressure
		M.S. Plate 10 mm thick	valve and Flash back
		in Horizontal position.	arrestor.
		(4 hrs.)	(06hrs)
	SMAW-09	31. Fillet "T" joint on M.S.	
		plate 10 mm thick in	
		Horizontal position.	
		<b>(2F)</b> (7 hrs.)	
	OAW-09	32. Fillet Lap joint on M.S.	- Oxygen gas and its
		sheet 2 mm thick in	properties
		horizontal position	- Production of oxygen by
		<b>(2F)</b> (10 hrs.)	Air liquefaction.
		33. Fillet Lap joint on M.S.	- Charging process of oxygen
	SMAW-10	plate 10 mm thick in	and acetylene gases
		horizontal position. (11	- Oxygen and Dissolved
		hrs.) <b>(2F)</b>	Acetylene gas cylinders



		0014/10	34. Fusion run with filler	and Color coding for different gas cylinders Gas regulators, types and uses. (06 hrs)
		OAW-10 OAW-11	rod in vertical position on 2mm thick M.S sheet. (7 hrs.) 35. Square Butt joint on M.S. sheet. 2 mm thick	- Oxy acetylene gas welding Systems (Low pressure and High pressure). Difference between gas welding blow pipe(LP &HP) and gas cutting blow pipe
		SMAW-11	in vertical position (3G)(7 hrs.) 36. Single Vee Butt joint on M.S. plate 12 mm thick in horizontal position (2G). (8hrs.)	- Gas welding techniques. Rightward and Leftward techniques. (06 hrs)
		SMAW- 12	37. Weaved bead on M.S	- Arc blow – causes and
		OAW-12 SMAW-13	Plate 10mm in vertical position.(7 hrs.)  38. Fillet "T" joint on M.S sheet 2 mm thick in vertical position. (3F)(7 hrs.)  39. Fillet "T" joint on M.S. plate 10 mm thick in	methods of controlling.  - Distortion in arc & gas welding and methods employed to minimize distortion  - Arc Welding defects, causes and Remedies.  (06 hrs)
			vertical position. (3F)(8	
Professional Skill 100 Hrs; Professional Knowledge 28 Hrs	Set the SMAW machine and perform different type of joints on MS in different position observing standard procedure. [different types of injects Fillet ( Tigint	OAW-13	hrs.)  40. Structural pipe welding butt joint on MS pipe Ø 50 and 3mm WT in 1G position. (15 hrs.)  41. Fillet Lap joint on M.S. Plate 10 mm in vertical position. (3G)(10 hrs.)	<ul> <li>Specification of pipes, various types of pipe joints, pipe welding all positions, and procedure.</li> <li>Difference between pipe welding and plate welding. (07 hrs)</li> </ul>
	joints- Fillet ( T-joint, lap & Corner), Butt (Square & V); different	SMAW-15	42. Open Corner joint on MS plate 10 mm thick in	- Pipe development for Elbow joint, "T" joint, Y
	Square & VI, aijjerent		INIS Place TO HILL CHICK III	LIDOW JOINE, 1 JOINE, 1



	position - 1F, 2F,		vertical position. (2F)(10	joint and branch joint
	3F,4F, 1G, 2G, 3G, 4G]		hrs.)	- Manifold system
		OAW-14	43. Pipe welding - Elbow	(07 hrs)
			joint on MS pipe Ø 50	
	Perform welding in		and 3mm WT. <b>(1G)</b> (15	
	different types of MS		hrs.)	
	pipe joints by Gas welding (OAW).  [Different types of MS pipe joints – Butt, Elbow, T-joint, angle	OAW-15 SMAW-16	44. Pipe welding "T" joint on MS pipe Ø 50 and 3mm WT. (1G)(10 hrs.)  45. Single "V" Butt joint on	<ul> <li>Gas welding filler rods, specifications and sizes.</li> <li>Gas welding fluxes – types and functions.</li> <li>Gas Brazing &amp; Soldering :</li> </ul>
	(45°) joint, flange joint]	SIVIAW-10	MS plate12 mm thick in vertical position (3G). (15 hrs.)	principles, types fluxes & uses Gas welding defects, causes and remedies (07 hrs)
		OAW-16		- Electrode : types, functions
			joint on MS pipe Ø 50 and 3mm WT. <b>(1G)</b> (15	of flux, coating factor, sizes of electrode Coding of
			hrs.)	electrode as per BIS, AWS,
			1113.)	- Effects of moisture pick up.
		SMAW-17	47. Straight line beads on	- Storage and baking of
		SIVIAVV-17	M.S. plate 10mm thick	electrodes.
			in over head position.	- Special purpose electrodes
			(10 hrs.)	and their applications. (07 hrs)
Professional	Set the SMAW	SMAW-18	48. Pipe Flange joint on	- Weldability of metals,
Skill 75 Hrs;	machine and perform		M.S plate with MS pipe	importance of pre heating,
Duofoosisus	different type of joints		Ø 50 mm X 3mm WT	post heating and
Professional	on MS in different		<b>(1F)</b> (15 hrs.)	maintenance of inter pass
Knowledge	position observing			temperature.
21 Hrs	standard procedure.	SMAW-19	49. Fillet "T" joint on M.S.	(07 hrs)
	[different types of		plate 10 mm thick in	
	joints- Fillet ( T-joint,		over head position.	
	lap & Corner), Butt		<b>(4F)</b> (10 hrs.)	
	(Square & V); different	SMAW-20	50. Pipe welding butt joint	- Classification of steel.
	position - 1F, 2F,		on MS pipe Ø 50 and 5	- Welding of low, medium
			mm WT. in 1G position.	and high carbon steel and



	3F,4F, 1G, 2G, 3G, 4G]		(15 hrs.)	alloy steels.
	31,41,10,20,30,40]	SMAW-21	51. Fillet Lap joint on M.S.	(07 hrs)
		JIVIAVV-ZI	plate 10 mm thick in	(07 1113)
	Set the SMAW		over head position.	
	machine and perform		(4G). (10 hrs.)	
	welding in different	SMAW-22	52. Single "V" Butt joint on	- Effects of alloying
	types of MS pipe	SIVIAVV-ZZ	MS plate 10mm thick in	elements on steel
	joints by SMAW.		over head position(4G)	- Stainless steel types- weld
	[Different types of MS		(15 hrs.)	decay and weldability.
	pipe joints – Butt,	SMAW-23	53. Pipe butt joint on M. S.	(07 hrs)
	Elbow, T-joint, angle	SIVIAVV-25	pipe Ø 50mm WT 6mm	(07 1115)
	(45°) joint, flange		( <b>1G</b> Rolled).(10 hrs.)	
	joint]		( <b>10</b> Rolled).(10 IIIs.)	
Professional	Choose appropriate	OAW-17	54. Square Butt joint on	- Brass – types – properties
Skill 25 Hrs;	welding process and		S.S. sheet. 2 mm thick	and welding methods.
Duefeesienel	perform joining of		in flat position. <b>(1G)</b> (8	- Copper – types –
Professional	different types of		hrs.)	properties and welding
Knowledge	metals and check its	SMAW -24	55. Square Butt joint on S.S.	methods.
07 Hrs	correctness.		Sheet 2 mm thick in flat	(07 hrs)
	[appropriate welding		position. <b>(1G)</b> (8 hrs.)	
	process – OAW,	OAW-18	56. Square Butt joint on	
	SMAW; Different		Brass sheet 2 mm thick	
	metal – SS, CI, Brass,		in flat position. <b>(1G)</b> (9	
	Aluminium]		hrs.)	
Professional	Choose appropriate	OAW-19	57. Square Butt & Lap joint	- Aluminium and its alloys,
Skill 25 Hrs;	welding process and		on M.S. sheet 2 mm	properties and weldability,
Drofossional	perform joining of		thick by brazing in flat	Welding methods
Professional	different types of	SMAW-25	position. (11 hrs.)	- Arc cutting & gouging,
Knowledge	metals and check its		58. Single "V" butt joint C.I.	(07 hrs)
07 Hrs	correctness.		plate 6mm thick in flat	
	[appropriate welding	AG-01	position. <b>(1G)</b> (11 hrs.)	
	process – OAW,		59. Arc gouging on MS plate	
	SMAW; Different		10 mm thick. (3 hrs.)	
	metal – SS, CI, Brass,			
	Aluminium]			
	Demonstrate arc			
	gauging operation to			



	rectify the weld joints.			
Professional Skill 25 Hrs;	Choose appropriate welding process and	OAW-20	60. Square Butt joint on Aluminium sheet. 3	- Cast iron and its properties types.
Professional	perform joining of		mm thick in flat	- Welding methods of cast
Knowledge	different types of		position. (12 hrs.)	iron.
07 Hrs	metals and check its correctness.	OAW-21	61. Bronze welding of cast iron (Single "V" butt	(07 hrs)
	[appropriate welding	UAW-21	joint) 6mm thick plate	
	process – OAW,		( <b>1G).</b> (13 hrs.)	
	SMAW; Different			
	metal – SS, CI, Brass,			
	Aluminium]			
Professional	Test welded joints by	I&T-02	62. Dye penetrant test. (5	- Types of Inspection
Skill 25 Hrs;	different methods of		hrs.)	methods
Professional	testing. [different	I&T-03	63. Magnetic particle test.	- Classification of
Knowledge	methods of testing- Dye penetration test,	   I&T-04	(5 hrs.) 64. Nick- break test. (5	destructive and NDT methods
07 Hrs	Magnetic particle test,	101-04	hrs.)	- Welding economics and
	Nick break test, Free	   I&T-05	65. Free bend test. (5 hrs.)	
	band test, Fillet	I&T-06	66. Fillet fracture test. (5	(07 hrs)
	fracture test]		hrs.)	, ,
Professional	Set GMAW machine		67. Introduction to safety	- Safety precautions in Gas
Skill 200 Hrs;	and perform welding	GMAW- 01	equipment and their	Metal Arc Welding and Gas
Professional	in different types of		use etc. (2 hrs.)	Tungsten Arc welding.
Knowledge	joints on MS		68. Setting up of GMAW	- Introduction to GMAW -
56 Hrs	sheet/plate by GMAW		welding machine &	equipment – accessories.
	in various positions by	CNAANA OO	accessories and	- Various other names of the
	dip mode of metal transfer. [different	GIVIAW - UZ	striking an arc. (4 hrs.) 69. Depositing straight	process. (MIG/MAG/CO <sub>2</sub> welding.)
	types of joints- Fillet		line beads on M.S	(05 hrs)
	(T-joint, lap, Corner),		Plate. (10 hrs.)	(55 1115)
	Butt (Square & V);		70. Fillet weld – "T" joint	
	various positions- 1F,		on M.S plate 10mm	
	2F, 3F,4F, 1G, 2G, 3G]		thick in flat position by	



		Dip transfer. (1F) (4	
		hrs.)	
GMAW -03	71.	Fillet weld – Lap joint	- Advantages of GMAW
		on M.S. sheet 3mm	welding over SMAW ,
		thick in flat position by	limitations and
		Dip transfer. (1F) (5	applications
		hrs.)	- Process variables of
GMAW -04	72.	Fillet weld – "T" joint	GMAW.
		on M.S. sheet 3mm	- Modes of metal transfer –
		thick in flat position by	dip or short circuiting
		Dip transfer. (1F)	transfer, spray transfer
		(5hrs.)	(free flight transfer) and
GMAW -05	73.	Fillet weld – corner	globular transfer
		joint on M.S. sheet	(intermittent transfer) and
		3mm thick in flat	Pulsed metal transfer.
		position by Dip	(05 hrs)
		transfer. (1F)(5 hrs.)	
GMAW -06	74.	Butt weld – Square	- Wire feed system – types –
		butt joint on M.S	care and maintenance.
		sheet 3mm thick in	- Welding wires used in
		flat position (1G) (07	GMAW, standard
		hrs.)	diameter and codification
GMAW -07	75.	Butt weld – Single "V"	as per AWS.
		butt joint on M.S plate	(05 hrs)
		10 mm thick by Dip	
		transfer in flat	
		position. (1G) (8	
		hrs.)	
GMAW -08	76.	Fillet weld – "T" joint	- Types of shielding gases
		on M.S plate 10mm	and gas mixtures used in
		thick in Horizontal	GMAW and its
		position by Dip	applications.
		transfer. <b>(2F)</b> (10	- Flux cored arc welding –
		hrs.)	description, advantage,
GMAW -09	77.	Fillet weld – corner	welding wires, coding as
		joint on M.S plate	per AWS.
		10mm thick in	(06 hrs)
		Horizontal position by	



		Dip transfer. (2F) (15	
		hrs.)	
GMAW -10	78.	Fillet weld – "T"	- Edge preparation of
		joint on M.S. sheet	various thicknesses of
		3mm thick in	metals for GMAW.
		Horizontal position by	- GMAW defects, causes and
		Dip transfer. (2F)	remedies
		(10 hrs.)	(07 hrs)
GMAW -11	79.	Fillet weld – corner	
		joint on M.S. sheet	
		3mm thick in	
		Horizontal position by	
		Dip transfer. (2F) (15	
		hrs.)	
GMAW -12	80.	Fillet weld – "T" joint	- Heat input and techniques
		on M.S plate 10mm	of controlling heat input
		thick in vertical	during welding.
		position by Dip	- Heat distribution and
		transfer. (3F) (10	effect of faster cooling
		hrs.)	(07 hrs)
GMAW -13	81.	Fillet weld – corner	
		joint on M.S plate	
		10mm thick in vertical	
		position by dip	
		transfer. (3F) (15	
		hrs.)	
GMAW -14	82.	Fillet weld – Lap joint	- Pre heating & Post Weld
		on M.S. sheet 3mm	Heat Treatment
		thick in vertical	- Use of temperature
		position by Dip	indicating crayons.
		transfer. (3F) (10	(07 hrs)
		hrs.)	
GMAW -15	83.	Fillet weld – corner	
		joint on M.S. sheet	
		3mm thick in vertical	
		position by Dip	
		transfer. <b>(3F)</b> (15	
		hrs.)	
		·	



		GMAW -16	84.	Fillet weld – Lap and	
				"T" joint on M.S sheet 3mm thick inover	process —principles,
				3mm thick inover head position by Dip	equipment, advantages and limitations
				transfer. <b>(4F)</b> (15	- Electro slag and Electro gas
		GMAW -17		hrs.)	welding processes—
			85.	Tee Joints on MS Pipe	principles, equipments,
				Ø 60 mm OD x 3 mm	advantages and
				WT 1G position – Arc	limitations.
				constant (Rolling) (10	(07 hrs)
				hrs.)	
		GMAW -18	86.	Depositing bead on	- Thermit welding process-
				S.S sheet in flat	types, principles,
				position. (10 hrs.)	equipments, Thermit
		GMAW -19	87.	Butt joint on Stainless	
				steel 2 mm thick sheet	' '
				in flat position by Dip	- Use of backing strips and
				transfer. (15 hrs.)	backing bars
		0=1111			(07 hrs)
Professional	Set the GTAW	GTAW -01	88.	Depositing bead on Aluminium sheet 2	•
Skill 100 Hrs;	machine and perform welding by GTAW in			Aluminium sheet 2 mm thick in flat	description. Difference between AC and DC
Professional	different types of			position. (10 hrs.)	welding, equipments,
Knowledge	joints on different	GTAW -02	89.	Square butt joint on	
28 Hrs	metals in different			Aluminium sheet	· · ·
	position and check			1.6mm thick in flat	
	correctness of the			position. (15 hrs.)	- Power sources for GTAW -
	weld. [different types				AC &DC
	of joints- Fillet ( T-				(07 hrs)
	joint, lap, Corner),	GTAW -03	90.	Fillet weld – "T" joint	- Tungsten electrodes –
	Butt (Square & V) ;			on Aluminium sheet	types & uses, sizes and
	different metals-			1.6 mm thick in flat	preparation
	Aluminium, Stainless			position. <b>(1F)</b> (10 hrs.)	- GTAW Torches- types,
	Steel; different	GTAW -04	91.	Fillet weld – Outside	parts and their functions
	position- 1F & 1G]			corner joint on	
				Aluminium sheet 2	
				mm thick in flat	(U/ nrs)
				position. <b>(1F)</b> (15 hrs.)	



		GTAW -05	92.	Butt weld - Square butt joint on Stainless steel sheet 1.6 mm thick in flat position with purging gas (1G) (25 hrs.)	<ul> <li>Edge preparation and fit up.</li> <li>GTAW parameters for welding of different thickness of metals</li> <li>Pulsed TIG welding - brief description, pulse parameters slope up and slope down.</li> <li>(07 hrs)</li> </ul>
		GTAW -06	93.	Fillet weld – "T" joint on Stainless steel sheet 1.6 mm thick in flat position. (1F) (25 hrs.)	' '
Professional Skill 25 Hrs; Professional Knowledge 07 Hrs	Perform Aluminium & MS pipe joint by GTAW in flat position.	GTAW -07	94.	Pipe butt joint on Aluminium pipe Ø 50 mm x 3 mm WT in Flat position. (1G) (25 hrs.)	equipment and application
Professional Skill 25 Hrs; Professional Knowledge 07 Hrs	Perform Aluminium & MS pipe joint by GTAW in flat position.  Set the Plasma Arc cutting machine and cut ferrous & non-	GTAW -08 PAC-01	95. 96.	"T" Joints on MS Pipe Ø 50 mm OD x 3 mm WT, position — Flat (1F) (15 hrs.) Straight cutting on ferrous and non ferrous (10 hrs.)	<ul> <li>equipments and principles of operation.</li> <li>Types of Plasma arc, advantages and applications.</li> </ul>
Professional Skill 25 Hrs; Professional Knowledge 07 Hrs	ferrous metals.  Set the resistance spot welding machine and join MS & SS sheet.	RW-01	97.	Lap joint on Stainless steel sheet by Resistance Spot welding. (10 hrs.) MS sheets joining by Resistance Spot welding (15 hrs.)	<ul> <li>(07 hrs)</li> <li>Resistance welding process -types, principles, power sources and welding parameters.</li> <li>Applications and limitations.</li> <li>(07 hrs)</li> </ul>
Professional	Perform joining of different similar and	OAW-01	99.	Square butt joint on Copper sheet 2mm	- Metalizing – types of metalizing principles,



CL:II FO III	diamination of the land		alitals to flag marketon and to control of the
Skill 50 Hrs;	dissimilar metals by		thick in flat position. equipments, advantages
Professional	brazing operation as		(1G) (15 hrs.) and applications
Knowledge	per standard	OAW-02	100. "T" joint on Copper to - Manual Oxy - acetylene
14 Hrs	procedure. [different		MS sheet powder coating process-
	similar and dissimilar		2mm thick in flat principles of operation and
	metals- Copper, MS,		position by applications
	SS]		Brazing <b>(1F)</b> (10 hrs.) (07 hrs)
		OAW-03	101. Silver brazing on S.S - Welding codes and
			Sheet with copper standards
			sheet "T" joint. (10 - Reading of assembly
			hrs.) drawing
		OAW-04	102. Silver brazing on - Welding Procedure
			copper tube to tube.   Specification (WPS) and
			(15 hrs.) Procedure Qualification
			Record ( PQR)
			(07 hrs)
Professional	Repair Cast Iron	OAW - 05	103. Repair welding of - Hard facing/ surfacing
Skill 25 Hrs;	machine parts by		broken C.I. machine necessity, surface
D ( ' '	selecting appropriate		parts by oxy-acetylene preparation, various hard
Professional	welding process.		welding with C.I and facing alloys and
Knowledge 07 Hrs	[Appropriate welding		bronze filler rod. (10 advantages of hard facing.
	process- OAW,		hrs.) (06 hrs)
	SMAW]	SMAW-01	104. Repair welding of
			broken C.I machine
	Hard facing of alloy		parts by C.I. electrode.
	steel components /		(8 hrs.)
	MS rod by using hard	SMAW-02	105. Hard surfacing
	facing electrode.		practice on M.S round
			rod Ø 25 mm by using
			Hard facing electrode
			in flat position. (7 hrs.)
In-plant traini	ng / Project work		1

## **In-plant training / Project work**

## **Broad area:**

- a) Universal welding manipulator
- b) Metal rack
- c) Cylinder trolley with chain provision for locking
- d) Welding fixture for TIG- butt/ corner joint with purging facility