

	SYLLABUS - WELDER							
	DURATION: ONE YEAR							
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 SMAW-01	 Demonstration of Machinery used in the trade. (6 hrs.) Identification to safety equipment and their use etc. (4 hrs.) Hack sawing, filing square to dimensions. (7 hrs.) Marking out on MS plate and punching. (8 hrs.) Setting of oxy-acetylene welding equipment, Lighting and setting of flame. (5 hrs.) Perform fusion run 	 General discipline in the Institute Elementary First Aid. Importance of Welding in Industry Safety precautions in Shielded Metal Arc 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 				



		0.004/02		
Professional Skill 25 Hrs;	Set the gas welding plant and join MS	OAW-02	9. Depositing bead with filler rod on M.S. sheet	 Different process of metal joining methods: Bolting,
3KIII 23 TII 3,	sheet in different		2 mm thick in flat	riveting, soldering, brazing,
Professional	position following		position. (10 hrs.)	seaming etc.
Knowledge	safety precautions.			 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
Professional	Set the SMAW	SMAW-02	11. Straight line beads on	(07 hrs) - Basic electricity applicable
Skill 25 Hrs;	machine and perform	SIVIAVV-UZ	M.S. plate 10 mm thick	to arc welding and related
5111 25 1113,	different type of joints		in flat position. (10 hrs.)	electrical terms
Professional	on MS in different			&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 (Square & V); different			And characteristics of arc.
	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	- Oxy-Acetylene Cutting
			±2mm. (4 hrs.)	Equipment principle,
		OAGC-03		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	
			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	- · ·
Skill 150 Hrs;	plant and join MS		M.S. sheet 2 mm thick	sources: Transformer,
Professional	sheet in different		in flat Position. (1G) (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
121113	[Different position: -	SMAW-04	Plate 10 mm thick in flat	care & maintenance
	1F, 2F, 3F, 1G, 2G,		position. (1F) (7 hrs.)	- Advantages and
	3G.]		21. Open corner joint on	disadvantages of A.C. and
		OAW-05	MS sheet 2 mm thick in	D.C. welding machines
	Set the SMAW		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		plate 10 mm thick in flat	EN &ASME: flat, horizontal,
	on MS in different	.	position. (1F) (7 hrs.)	vertical and over head
	position observing	OAW-06	23. Fillet "T" joint on MS	position.



standard procedure.		sheet 2 mm thick in flat	I
[different types of		position. (1F) (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 . (1F) (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	
		in Horizontal position.	
		(2G) (8 hrs.)	and generating methods.
	SMAW-08	30. Straight line beads and	
		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.	(00113)
	5117.100 05	plate 10 mm thick in	
		Horizontal position.	
		(2F)(7 hrs.)	
	OAW-09	32. Fillet Lap joint on M.S.	- Oxygen gas and its
	0400-03	sheet 2 mm thick in	properties
		horizontal position	
		(2F)(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.) (2F)	Acetylene gas cylinders



				and Color coding for different gas cylinders. - Gas regulators, types and
				uses. (06 hrs)
		OAW-10	34. Fusion run with filler	- Oxy acetylene gas welding
			rod in vertical position	Systems (Low pressure and
			on 2mm thick M.S	High pressure).
		0 4 1 4 1 1	sheet. (7 hrs.)	Difference between gas
		0AW-11	35. Square Butt joint on M.S. sheet. 2 mm thick	welding blow pipe(LP &HP) and gas cutting blow pipe
			in vertical position	- Gas welding techniques.
			(3G) (7 hrs.)	Rightward and Leftward
		SMAW-11	36. Single Vee Butt joint on	techniques.
			M.S. plate 12 mm thick	(06 hrs)
			in horizontal position	
			(2G) . (8hrs.)	
		SMAW- 12		- Arc blow – causes and
			Plate 10mm in vertical	methods of controlling.
		OAW-12	position.(7 hrs.) 38. Fillet "T" joint on M.S	 Distortion in arc & gas welding and methods
		04012	sheet 2 mm thick in	employed to minimize
			vertical position. (3F)(7	distortion
			hrs.)	- Arc Welding defects,
		SMAW-13	39. Fillet "T" joint on M.S.	causes and Remedies.
			plate 10 mm thick in	(06 hrs)
			vertical position. (3F) (8	
			hrs.)	
Professional	Set the SMAW	OAW-13	40. Structural pipe welding	- Specification of pipes,
Skill 100 Hrs;	machine and perform		butt joint on MS pipe Ø 50 and 3mm WT in 1G	various types of pipe
Professional	different type of joints on MS in different		position. (15 hrs.)	joints, pipe welding all positions, and procedure.
Knowledge	position observing	SMAW-14	41. Fillet Lap joint on M.S.	- Difference between pipe
28 Hrs	standard procedure.		Plate 10 mm in vertical	welding and plate welding.
	[different types of		position. (3G) (10 hrs.)	(07 hrs)
	joints- Fillet (T-joint,			
	lap & Corner), Butt	SMAW-15	42. Open Corner joint on	- Pipe development for
	(Square & V); different		MS plate 10 mm thick in	Elbow joint, "T" joint, Y



position1F, 2F, 3F,4F, 1G, 2G, 3G, 4G]vertical position. (2F)(10 hrs.)joint and branch joint3F,4F, 1G, 2G, 3G, 4G]OAW-1443. Pipe welding - Elbow joint on MS pipe Ø 50 and 3mm WT. (1G)(15 hrs.)(07 hrs)Perform welding in different types of MS pipe joints - Butt, Elbow, T-joint, angle (45°) joint, flange joint]OAW-1544. Pipe welding "T" joint on MS pipe Ø 50 and 3mm WT. (1G)(10 hrs.) a Gas welding filler rods, specifications and sizes. Gas welding filler rods, specifications and sizes.IDifferent types of MS pipe joints - Butt, Elbow, T-joint, angle (45°) joint, flange joint]OAW-1645. Single "V" Butt joint on MS plate12 mm thick in vertical position (3G). (15 hrs.)- Gas welding filler rods, specifications and sizes. - Gas welding defects, causes and remedies (07 hrs)OAW-1646. Pipe welding 45 * angle joint on MS pipe Ø 50 and 3mm WT. (1G)(15 hrs.)- Electrode : types, functions of flux, coating factor, sizes of electrode as per BIS, AWS, - Effects of moisture pick up.Professional Knowledge 21 HrsSet the SMAW MS in different position observing standard procedure.SMAW-1848. Pipe Flange joint on M.S plate with MS pipe Ø 50 mm X 3mm WT (1F)(15 hrs.)- Weldability of metals, importance of pre heating, post heating and maintenance of inter pass temperature.		nonition 45 25			
OAW-1443. Pipe welding - Elbow joint on MS pipe Ø 50 and 3mm WT. (1G)(15 hrs.)(07 hrs)Perform welding in different types of MS pipe joints by Gas (04W).OAW-1544. Pipe welding "T" joint on MS pipe Ø 50 and 3mm WT. (1G)(10 hrs.)- Gas welding filler rods, specifications and sizes.IDifferent types of MS pipe joints - Butt, Elbow, T-joint, angle (45°) joint, flange joint]OAW-1544. Pipe welding "T" joint on MS pipe Ø 50 and 3mm WT. (1G)(10 hrs.)- Gas welding filler rods, specifications and sizes.MAW-1645. Single "V" Butt joint on MS plate12 mm thick in vertical position (3G). (15 hrs.)- Gas welding defects, causes and remedies (07 hrs)OAW-1646. Pipe welding 45 * angle joint on MS pipe Ø 50 and 3mm WT. (1G)(15 hrs.)- Electrode : types, functions of flux, coating factor, sizes of electrode coding of electrode as per BIS, AWS, - Effects of moisture pick up.Professional Skill 75 Hrs;Setthe SMAW48. Pipe Flange joint on MS plate with MS pipe Ø 50 mm X 3mm WT (1F)(15 hrs.)- Weldability of metals, importance of pre heating, post heating and maintenance of inter pass temperature.					
Perform welding in different types of MS pipe joints by Gas welding (OAW) (Different types of MS pipe joints - Butt, Elbow, T-joint, angle (45°) joint, flange joint]OAW-1544. Pipe welding "T" joint on MS pipe Ø 50 and 3mm WT. (1G)(10 hrs.)- Gas welding filler rods, specifications and sizes. - Gas welding fluxes - types and functions.SMAW-16SSMAW-1645. Single "V" Butt joint on MS plate12 mm thick in vertical position (3G). (15 hrs.)- Gas welding fillers of MS specifications and sizes. - Gas welding fluxes - types and functions.OAW-1646. Pipe welding 45° angle joint on MS pipe Ø 50 and 3mm WT. (1G)(15 hrs.)- Electrode : types, functions of flux, coating factor, sizes of electrode Coding of electrode as per BIS, AWS, - Effects of moisture pick up.SMAW-1747. Straight line beads on M.S. plate 10mm thick in over head position. (10 hrs.)- Storage and baking of electrodes.Professional Skill 75 Hrs; machine and perform different type of joints on MS in different position observingSMAW-1848. Pipe Flange joint on M.S. plate with MS pipe Ø 50 mm X 3mm WT (1F)(15 hrs.)- Weldability of metals, importance of pre heating, post heating and maintenance of inter pass temperature.		3F,4F, 1G, 2G, 3G, 4G]	• • • • • • •	,	•
Perform welding in different types of MSand 3mm WT. (1G)(15 hrs.)Gas welding filler rods, specifications and sizes.pipe joints by Gas welding (OAW). [Different types of MS pipe joints - Butt, Elbow, T-joint, angleOAW-1544. Pipe welding "T" joint on MS pipe Ø 50 and 3mm WT. (1G)(10 hrs.) 45. Single "V" Butt joint on MS plate12 mm thick in vertical position (3G). (15 hrs.)- Gas welding filler rods, specifications and sizes. - Gas welding fluxes - types and functions.OAW-1645. Single "V" Butt joint on MS plate12 mm thick in vertical position (3G). (15 hrs.)- Gas welding defects, causes and remedies (07 hrs)OAW-1646. Pipe welding 45 ° angle joint on MS pipe Ø 50 and 3mm WT. (1G)(15 hrs.)- Electrode : types, functions of flux, coating factor, sizes of flux, coating factor, sizes of electrode as per BIS, AWS, - Effects of moisture pick up.Professional Knowledge 21 Hrs;Set the SMAW of MS in different position observingSMAW-1848. Pipe Flange joint on MS plate with MS pipe Ø 50 mm X 3mm WT (1F)(15 hrs.)- Weldability of metals, importance of pre heating, post heating and maintenance of inter pass temperature.			OAW-14		(07 hrs)
different types of MS pipe joints by Gas welding (OAW). [Different types of MS pipe joints - Butt, Elbow, T-joint, angle (45°) joint, flangeOAW-1544. Pipe welding "T" joint on MS pipe Ø 50 and 3mm WT. (1G)(10 hrs.) 45. Single "V" Butt joint on MS plate12 mm thick in vertical position (3G). (15 hrs.)- Gas welding filler rods, specifications and sizes. - Gas welding fluxes - types and functions.OAW-1646. Pipe welding 45 * angle joint on MS pipe Ø 50 and 3mm WT. (1G)(15 hrs.)- Gas welding defects, causes and remedies (07 hrs)OAW-1646. Pipe welding 45 * angle joint on MS pipe Ø 50 and 3mm WT. (1G)(15 hrs.)- Electrode : types, functions of flux, coating factor, sizes of electrode as per BIS, AWS, - Effects of moisture pick up.Professional Ksill 75 Hrs;Set the SMAW machine and perform different type of joints on MS in different position observingSMAW-1848. Pipe Flange joint on M.S. plate with MS pipe Ø 50 mm X 3mm WT (1F)(15 hrs.)- Weldability of metals, importance of inter pass temperature.					
pipe joints by Gas welding (OAW). [Different types of MS pipe joints - Butt, Elbow, T-joint, angle (45°) joint]OAW-1544. Pipe welding "T" joint on MS pipe Ø 50 and 3mm WT. (1G)(10 hrs.)- Gas welding filler rods, specifications and sizes.Elbow, T-joint, angle (45°) joint]SMAW-16SMAW-1645. Single "V" Butt joint on MS plate12 mm thick in vertical position (3G). (15 hrs.)- Gas welding fluxes - types and functions.OAW-1646. Pipe welding 45 ° angle joint]- Gas welding defects, causes and remedies (07 hrs)OAW-1646. Pipe welding 45 ° angle joint on MS pipe Ø 50 and 3mm WT. (1G)(15 hrs.)- Electrode : types, functions of flux, coating factor, sizes of electrode coding of electrode as per BIS, AWS, - Effects of moisture pick up.SMAW-17SMAW-1747. Straight line beads on M.S. plate 10mm thick in over head position. (10 hrs.)- Special purpose electrodes and their applications. (07 hrs)Professional KnowledgeSet the SMAW machine and perform different type of joints on MS in different position observingSMAW-1848. Pipe Flange joint on M.S. plate with MS pipe Ø 50 mm X 3mm WT (1F)(15 hrs.)- Weldability of metals, importance of inter pass temperature.		-			
welding (Different types of MS pipe joints - Butt, Elbow, T-joint, angle (45°) joint, flange joint]SMAW-16on MS pipe Ø 50 and 3mm WT. (1G)(10 hrs.)specifications and sizes. - Gas welding fluxes - types and functions.(45°) joint, flange joint]SMAW-16SMAW-1645. Single "V" Butt joint on wertical position (3G). (15 hrs.)- Gas welding defects, causes and remedies (07 hrs)OAW-16A6. Pipe welding 45° angle joint on MS pipe Ø 50 and 3mm WT. (1G)(15 hrs.)- Electrode : types, functions of flux, coating factor, sizes of electrode coding of electrode as per BIS, AWS, electrode as per BIS, AWS, electrode as per BIS, AWS, in over head position. (10 hrs.)- Effects of moisture pick up.Professional KnowledgeSet the SMAW machine and perform different type of joints on MS in different position observingSMAW-1848. Pipe Flange joint on M.S plate with MS pipe Ø 50 mm X 3mm WT (1F)(15 hrs.)- Weldability of metals, importance of pre heating, post heating and maintenance of inter pass temperature.				,	
Image: Instant StateImage:			OAW-15	44. Pipe welding "T" joint	- Gas welding filler rods,
pipe joints - Butt, Elbow, T-joint, angle (45°) joint]SMAW-1645. Single "V" Butt joint on MS plate12 mm thick in vertical position (3G). (15 hrs.)and functions.Gas Brazing & Soldering : principles, types fluxes & usesJoint]OAW-1646. Pipe welding 45° angle joint on MS pipe Ø 50 and 3mm WT. (1G)(15 hrs.)- Electrode : types, functions of flux, coating factor, sizes of electrode coding of electrode as per BIS, AWS, - Effects of moisture pick up.SMAW-1747. Straight line beads on M.S. plate 10mm thick in over head position. (10 hrs.)- Storage and baking of electrodes.Professional Knowledge 21 HrsSet the SMAW machine and perform different type of joints on MS in different position observingSMAW-1848. Pipe Flange joint on M.S plate with MS pipe Ø 50 mm X 3mm WT (1F)(15 hrs.)- Weldability of metals, importance of pre heating, post heating and maintenance of inter pass temperature.		-			
Elbow, T-joint, angle (45°) joint]SMAW-1645. Single "V" Butt joint on MS plate12 mm thick in vertical position (3G). (15 hrs.)- Gas Brazing & Soldering : principles, types fluxes & usesOAW-1646. Pipe welding 45 ° angle joint on MS pipe Ø 50 and 3mm WT. (1G)(15 hrs.)- Electrode : types, functions of flux, coating factor, sizes of electrode coding of electrode as per BIS, AWS, - Effects of moisture pick up.Professional Knowledge rofessional Knowledge No MS in different position observingSMAW-1848. Pipe Flange joint on MS plate with MS pipe Ø 50 mm X 3mm WT (1F)(15 hrs.)- Weldability of metals, importance of inter pass temperature.				3mm WT. (1G) (10 hrs.)	 Gas welding fluxes – types
(45°) joint, flange joint]MS plate12 mm thick in vertical position (3G). (15 hrs.)principles, types fluxes & usesOAW-1646. Pipe welding 45 ° angle joint on MS pipe Ø 50 and 3mm WT. (1G)(15 hrs.)- Electrode : types, functions of flux, coating factor, sizes of electrode Coding of electrode as per BIS, AWS, - Effects of moisture pick up.Professional Knowledge 20 Hrs;Set the SMAW-17SMAW-18 SMAW-1848. Pipe Flange joint on M.S plate with MS pipe Ø 50 mm X 3mm WT (1F)(15 hrs.)- Weldability of metals, importance of pre heating, Ø 50 mm X 3mm WT (1F)(15 hrs.)					and functions.
joint]vertical position (3G). (15 hrs.)uses (3G). (15 hrs.)OAW-1646. Pipe welding 45 ° angle joint on MS pipe Ø 50 and 3mm WT. (1G)(15 hrs.)- Electrode : types, functions of flux, coating factor, sizes of electrode Coding of electrode as per BIS, AWS, - Effects of moisture pick up.Professional Knowledge 20 Hrs;Set the SMAW machine and perform different type of joints on MS in different position observingSMAW-18 SMAW-1848. Pipe Flange joint on M.S. plate with MS pipe Ø 50 mm X 3mm WT (1F)(15 hrs.)- Weldability of metals, importance of inter pass temperature.			SMAW-16	45. Single "V" Butt joint on	- Gas Brazing & Soldering :
Professional Skill 75 Hrs;Set the scheme and perform different type of joints on MS in different position observingSMAW-1848. Pipe Flange joint on M.S. plate with MS pipe g 50 mm X 3mm WT (1F)(15 hrs.)- Gas causes and remedies (07 hrs)Professional Knowledge 21 HrsSet the scheme and perform different type of joints on MS in different position observingSMAW-1848. Pipe Flange joint on M.S. plate with MS pipe g 50 mm X 3mm WT (1F)(15 hrs.)- Gas causes and remedies (07 hrs)Professional Knowledge 21 HrsSet the scheme and perform different position on MS in different position observingSMAW-18 the				MS plate12 mm thick in	principles, types fluxes &
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Professional Skill 75 Hrs;Set the SMAW and perform different type of joints on MS in different positionSMAW-1848. Pipe Flange joint on MS pipe joint on MS pipe importance of pre heating, post heating and maintenance of inter pass temperature.				(15 hrs.)	- Gas welding defects,
OAW-1646. Pipe welding 45 ° angle joint on MS pipe Ø 50 and 3mm WT. (1G)(15 hrs.)- Electrode : types, functions of flux, coating factor, sizes of electrode Coding of electrode as per BIS, AWS, - Effects of moisture pick up.SMAW-1747. Straight line beads on M.S. plate 10mm thick in over head position. (10 hrs.)- Storage and baking of electrodes.Professional Skill 75 Hrs;Set machine and perform different type of joints on MS in different position observingSMAW-1848. Pipe Flange joint on M.S plate with MS pipe Ø 50 mm X 3mm WT (1F)(15 hrs.)- Weldability of metals, importance of inter pass temperature.					causes and remedies
Joint on MS pipe Ø 50 and 3mm WT. (1G)(15 hrs.)of flux, coating factor, sizes of electrode Coding of electrode as per BIS, AWS, - Effects of moisture pick up.SMAW-17SMAW-1747. Straight line beads on M.S. plate 10mm thick in over head position. (10 hrs.)- Storage and baking of electrodes.Professional Skill 75 Hrs;Set the SMAW machine and perform different type of joints on MS in different position observingSMAW-1848. Pipe Flange joint on M.S. plate with MS pipe Ø 50 mm X 3mm WT (1F)(15 hrs.)- Weldability of metals, importance of inter pass temperature.					(07 hrs)
And 3mm WT. (1G)(15 hrs.)of electrode Coding of electrode as per BIS, AWS, - Effects of moisture pick up.SMAW-1747. Straight line beads on M.S. plate 10mm thick in over head position. (10 hrs.)- Storage and baking of electrodes.Professional Skill 75 Hrs;Set the SMAW machine and perform different type of joints on MS in different position observingSMAW-18 AWS48. Pipe Flange joint on M.S. plate with MS pipe Ø 50 mm X 3mm WT (1F)(15 hrs.)- Weldability of metals, importance of pre heating, post heating and maintenance of inter pass temperature.			OAW-16	46. Pipe welding 45 ° angle	- Electrode : types, functions
hrs.)electrode as per BIS, AWS, - Effects of moisture pick up.SMAW-1747. Straight line beads on M.S. plate 10mm thick in over head position. (10 hrs.)- Storage and baking of electrodes.Professional Skill 75 Hrs;Set the SMAW machine and perform different type of joints on MS in different position observingSMAW-1848. Pipe Flange joint on M.S. plate with MS pipe Ø 50 mm X 3mm WT (1F)(15 hrs.)- Weldability of metals, importance of inter pass temperature.				joint on MS pipe Ø 50	of flux, coating factor, sizes
SMAW-17SMAW-1747. Straight line beads on M.S. plate 10mm thick in over head position. (10 hrs.)- Effects of moisture pick up. - Storage and baking of electrodes. - Special purpose electrodes and their applications. (07 hrs)Professional Skill 75 Hrs;Set machine and perform different type of joints on MS in different positionSMAW-18 MAW-1848. Pipe Flange joint on M.S plate with MS pipe Ø 50 mm X 3mm WT (1F)(15 hrs.)- Weldability of metals, importance of pre heating, post heating and maintenance of inter pass temperature.				and 3mm WT. (1G) (15	of electrode Coding of
SMAW-1747. Straight line beads on M.S. plate 10mm thick in over head position. (10 hrs.)- Storage and baking of electrodes.Professional Skill 75 Hrs;Set the SMAW machine and perform different type of joints on MS in different position observingSMAW-18 MAW-1848. Pipe Flange joint on M.S plate with MS pipe Ø 50 mm X 3mm WT (1F)(15 hrs.)- Weldability of metals, importance of pre heating, post heating and maintenance of inter pass temperature.				hrs.)	electrode as per BIS, AWS,
M.S. plate 10mm thick in over head position. (10 hrs.)electrodes.Professional Skill 75 Hrs; Professional Knowledge 21 HrsSet in different positionSMAW-18 in different position48. Pipe Flange joint on M.S. plate with MS pipe Ø 50 mm X 3mm WT (1F)(15 hrs.)- Weldability of metals, importance of pre heating, post heating and maintenance of inter pass temperature.					- Effects of moisture pick up.
in over head position. (10 hrs.)- Special purpose electrodes and their applications. (07 hrs)Professional Skill 75 Hrs; Professional Knowledge 21 HrsSet the SMAW machine and perform different type of joints on MS in different position observingSMAW-18 MAW-1848. Pipe Flange joint on M.S plate with MS pipe Ø 50 mm X 3mm WT (1F)(15 hrs.)- Weldability of metals, importance of pre heating, post heating and maintenance of inter pass temperature.			SMAW-17	47. Straight line beads on	- Storage and baking of
Image: constraint of the second state(10 hrs.)and their applications. (07 hrs)Professional Skill 75 Hrs;Set the SMAW machine and perform different type of joints on MS in different position observingSMAW-18 MAW-1848. Pipe Flange joint on M.S plate with MS pipe Ø 50 mm X 3mm WT (1F)(15 hrs.)- Weldability of metals, importance of pre heating, post heating and maintenance of inter pass temperature.				M.S. plate 10mm thick	electrodes.
Image: constraint of the second stateSMAWSMAW-1848. Pipe Flange joint on M.S plate with MS pipe- Weldability of metals, importance of pre heating, post heatingProfessional Knowledge 21 HrsSet the SMAW machine and perform on MS in different position observingSMAW-1848. Pipe Flange joint on M.S plate with MS pipe Ø 50 mm X 3mm WT (1F)(15 hrs.)- Weldability of metals, importance of pre heating, post heating and maintenance of inter pass temperature.				in over head position.	- Special purpose electrodes
Professional Skill 75 Hrs;Set machine and perform different type of joints on MS in different positionSMAW-1848. Pipe Flange joint on MS in different (1F)(15 hrs.)- Weldability importance of pre heating, Ø 50 mm X 3mm WT (1F)(15 hrs.)Professional Knowledge 21 HrsSet the still 75 Hrs;SMAW-1848. Pipe Flange joint M.S plate with MS pipe Ø 50 mm X 3mm WT (1F)(15 hrs.)- Weldability importance of pre heating, post heating maintenance of inter pass temperature.				(10 hrs.)	and their applications.
Skill 75 Hrs;machine and perform different type of joints on MS in different position observingM.S plate with MS pipe Ø 50 mm X 3mm WT (1F)(15 hrs.)importance of pre heating, post heating and maintenance of inter pass temperature.					(07 hrs)
Professional Knowledgedifferent type of joints on MS in different position observingØ 50 mm X 3mm WT (1F)(15 hrs.)post heating maintenance of inter pass temperature.	Professional	Set the SMAW	SMAW-18	48. Pipe Flange joint on	- Weldability of metals,
Professional Knowledgeon MS in different position(1F)(15 hrs.)maintenance of inter pass temperature.	Skill 75 Hrs;	machine and perform		M.S plate with MS pipe	importance of pre heating,
Knowledge positionon MS in different observing(1F)(15 hrs.)maintenance of inter pass temperature.	Desfersteret	different type of joints		Ø 50 mm X 3mm WT	post heating and
21 Hrs position observing temperature.		on MS in different		(1F) (15 hrs.)	maintenance of inter pass
standard procedure. SMAW-19 49. Fillet "T" joint on M.S. (07 hrs)	0	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		[different types of		plate 10 mm thick in	
joints- Fillet (T-joint, over head position.		joints- Fillet (T-joint,		over head position.	
<i>lap & Corner), Butt</i> (4F)(10 hrs.)		lap & Corner), Butt		(4F) (10 hrs.)	
(Square & V); different SMAW-20 50. Pipe welding butt joint - Classification of steel.		(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		position - 1F, 2F,		on MS pipe Ø 50 and 5	- Welding of low, medium
mm WT. in 1G position. and high carbon steel and				mm WT. in 1G position.	and high carbon steel and



	3F,4F, 1G, 2G, 3G, 4G]		(15 hrs.)	alloy steels.
	,,	SMAW-21	51. Fillet Lap joint on M.S.	(07 hrs)
			plate 10 mm thick in	(0)
	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		MS plate 10mm thick in	elements on steel
	joints by SMAW.		over head position(4G)	
	[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		pipe Ø 50mm WT 6mm	
	(45°) joint, flange		(1G Rolled).(10 hrs.)	
	joint]			
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.
Professional	perform joining of		in flat position. (1G) (8	- Copper – types –
	different types of		hrs.)	properties and welding
Knowledge 07 Hrs	metals and check its	SMAW -24	55. Square Butt joint on S.S.	methods.
07 115	correctness.		Sheet 2 mm thick in flat	(07 hrs)
	[appropriate welding		position. (1G) (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. (1G) (9	
	Aluminium]		hrs.)	
Professional	Choose appropriate	OAW-19	57. Square Butt & Lap joint	
Skill 25 Hrs;	welding process and		on M.S. sheet 2 mm	properties and weldability,
Professional	perform joining of		thick by brazing in flat	Welding methods
Knowledge	different types of	SMAW-25	position. (11 hrs.)	- Arc cutting & gouging,
07 Hrs	metals and check its		58. Single "V" butt joint C.I.	(07 hrs)
	correctness.		plate 6mm thick in flat	
	[appropriate welding	AG-01	position. (1G) (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	Choose appropriate	OAW-20	60. 9	Square Butt joint on	- Cast iron and its properties
Skill 25 Hrs;	welding process and			Aluminium sheet. 3	types.
Professional	perform joining of		r	mm thick in flat	- Welding methods of cast
Knowledge	different types of			position. (12 hrs.)	iron.
07 Hrs	metals and check its			Bronze welding of cast	(07 hrs)
	correctness.	OAW-21		ron (Single "V" butt	
	[appropriate welding			oint) 6mm thick plate	
	process – OAW,			1 G). (13 hrs.)	
	SMAW; Different				
	metal – SS, Cl, 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
	testing. [different	I&T-03	63.	Magnetic particle test.	- Classification of
Professional	methods of testing-			(5 hrs.)	destructive and NDT
Knowledge	Dye penetration test,	I&T-04	64.	Nick- break test. (5	methods
07 Hrs	Magnetic particle test,			hrs.)	- Welding economics and
	Nick break test, Free	I&T-05	65.	Free bend test. (5 hrs.)	Cost estimation.
	band test, Fillet	I&T-06	66.	Fillet fracture test. (5	(07 hrs)
	fracture test]			hrs.)	
Professional	Set GMAW machine		67.		- 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		60	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 in various positions by			welding machine & accessories and	equipment – accessories. - Various other names of the
	dip mode of metal	GMAW - 02		striking an arc. (4 hrs.)	process. (MIG/MAG/CO ₂
	transfer. [different	GIVIAW 02	69.	Depositing straight	welding.)
	types of joints- Fillet			line beads on M.S	(05 hrs)
	(T-joint, lap, Corner),			Plate. (10 hrs.)	· · ·
	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 on M.S. sheet 3mm thick in flat position by Dip transfer. (1F) (5 hrs.)	 Advantages of GMAW welding over SMAW , limitations and applications Process variables of
GMAW -04	72.	Fillet weld – "T" joint on M.S. sheet 3mm thick in flat position by Dip transfer. (1F) (5hrs.)	GMAW. - Modes of metal transfer – dip or short circuiting transfer, spray transfer (free flight transfer) and
GMAW -05	73.	Fillet weld – corner joint on M.S. sheet 3mm thick in flat position by Dip transfer. (1F) (5 hrs.)	globular transfer (intermittent transfer) and Pulsed metal transfer. (05 hrs)
GMAW -06	74.	Butt weld – Square butt joint on M.S sheet 3mm thick in flat position (1G) (07 hrs.)	 Wire feed system – types – care and maintenance. Welding wires used in GMAW, standard diameter and codification
GMAW -07	75.	Butt weld – Single "V" butt joint on M.S plate 10 mm thick by Dip transfer in flat position. (1G) (8 hrs.)	as per AWS. (05 hrs)
GMAW -08	76.	Fillet weld – "T" joint on M.S plate 10mm thick in Horizontal position by Dip transfer. (2F) (10 hrs.)	and gas mixtures used in GMAW and its
GMAW -09	77.	Fillet weld – corner joint on M.S plate 10mm thick in Horizontal position by	welding wires, coding as per AWS.



		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
	00.	on M.S plate 10mm	
		thick in vertical	o ,
		position by Dip	0 0
		transfer. (3F) (10	
		hrs.)	(07 hrs)
GMAW -13	01		(07 113)
GIVIAW -13	81.		
		joint on M.S plate	
		10mm thick in vertical	
		position by dip	
		transfer. (3F) (15	
		hrs.)	
GMAW -14	82.		•
		on M.S. sheet 3mm	
		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. (3F) (15	
		hrs.)	
		,	



		GMAW -16	84.	Fillet weld – Lap and	- Submerged arc welding
				"T" joint on M.S sheet	process –principles,
				3mm thick inover	equipment, advantages
				head position by Dip	and limitations
				transfer. (4F) (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	mixture types and
				steel 2 mm thick sheet	applications.
				in flat position by Dip	- Use of backing strips and
				transfer. (15 hrs.)	backing bars
					(07 hrs)
Professional	Set the GTAW	GTAW -01	88.	Depositing bead on	- GTAW process - brief
Skill 100 Hrs;	machine and perform			Aluminium sheet 2	description. Difference
	welding by GTAW in			mm thick in flat	between AC and DC
Professional	different types of			position. (10 hrs.)	welding, equipments,
Knowledge	joints on different	GTAW -02	89.	Square butt joint on	polarities and applications.
28 Hrs	metals in different			Aluminium sheet	- Various other names of
	position and check			1.6mm thick in flat	the process (TIG, Argonarc)
	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	· ,
	Butt (Square & V) ;			on Aluminium sheet	-
	different metals-			1.6 mm thick in flat	preparation
	Aluminium, Stainless			position. (1F) (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	selection criteria.
				mm thick in flat	
				position. (1F) (15 hrs.)	
				position. (11) (13 m3.)	



		GTAW -05	92.	butt joint on Stainless steel sheet 1.6 mm thick in flat position with purging gas (1G) (25 hrs.)	welding of different thickness of metals - Pulsed TIG welding - brief description, pulse parameters slope up and slope down. (07 hrs)
		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- ferrous metals.	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.)	3 () (
Professional Skill 25 Hrs; Professional Knowledge 07 Hrs	Set the resistance spot welding machine and join MS & SS sheet.	RW-01 RW-02	97. 98.	Lap joint on Stainless steel sheet by Resistance Spot welding. (10 hrs.) MS sheets joining by Resistance Spot welding (15 hrs.)	 Resistance welding process types, principles, power sources and welding parameters.
Professional	Perform joining of different similar and	OAW-01	99.	Square butt joint on Copper sheet 2mm	 Metalizing – types of metalizing principles,



Skill 50 Hrs;	dissimilar metals by		thick in flat position. equipments, advantages
Duefeedenal	brazing operation as		(1G) (15 hrs.) and applications
Professional	per standard	OAW-02	100. "T" joint on Copper to - Manual Oxy - acetylene
Knowledge 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 (1F) (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
Professional	selecting appropriate		parts by oxy-acetylene preparation, various hard
Knowledge	welding process.		welding with C.I and facing alloys and
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.)

- 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