

1	Name of Syllabus	C.C.IN WELDING (GAS AND ELECTRIC) (303116)																																								
2	Max.Nos of Student	25 students.																																								
3	Duration	6 Month																																								
4	Type	Part Time																																								
5	No's Of Days / Week	6 Days																																								
6	No's Of Hours /Days	4 Hrs																																								
7	Space Required	Workshop = 600 Sq feet Class Room = 200 Sq feet TOTAL = 800 Sq feet																																								
8	Entry Qualification	7 <sup>th</sup> passed																																								
9	Objective Of Syllabus/ introduction	Introduction – the syllabus of C.C.In Welding (Gas and Electric ) has been evolved in such a way that after completion of course of 6 months , the student would acquire good working skill suited to work as Welder. He would also gain confidence to operate arc and gas welding . <b>Objective:-</b> . 1) Develop skill in Fabrication by providing adequate knowledge of welding. 2) Develop confidence and entrepreneurship by arranging industrial visit and arranging study lecture of personal from industries.																																								
10	Employment Opportunity	Self employment /wage employment /employment																																								
11	Teacher's Qualification	a. S.S.C. pass with maths and science. b. Welder trade ITI course passed from recognized Industrial Training Institute. & NCTVT passed with 2 year experience.																																								
12	Training System	<b>Training System Per Week</b> <table><tr><td>Theory</td><td>Practical</td><td>Total</td></tr><tr><td>06 Hours</td><td>18 Hours</td><td>24 Hours</td></tr></table>						Theory	Practical	Total	06 Hours	18 Hours	24 Hours																													
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3	30311622	ARC WELDING	PR -II	6 hrs	200	100																																				
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**Syllabus :- WELDING (GAS AND ELECTRIC).**

**THEORY PAPER – I, WELDING**

1. Introduction in Welding. Importance of safety and general precautions. Workshop safety, Tools safety, personal safety.
2. Safety precautions in Gas and Electric Welding .
3. Elementary knowledge of first aid .
4. Description of tools and Equipment used in trade, Electric and Gas Welding equipment their assembly care/maintenance.
5. Different process as of metal joining.
6. Orthographic projections - Developments of solids. Reading of simple drawings of typical weld Joints.
7. Common gases used for welding. Oxygen, Hydrogen, Acetylene , Coal.
8. Types of flames their setting, uses .
9. Simple Electrical terms, their definitions.
10. Welding terms, definition - Gas welding flux.
11. Types of Joints and their applications.
12. Flame temperatures and their uses Identification of flames.
13. Electricity A.C. D.C. types of electric welding and applications.
14. Oxy-Acetylene cutting equipment their care and maintenance.
15. Welding machine types construction care and maintenance.
16. Welding Electrode – Types choice of Electrode and their storage.
17. Welding position welding slope and rotation pipe 1 G position.
18. Arc length - Advantages and Disadvantages.
19. Distortion causes and effects Methods employed to minimize distortion
20. Polarity -methods of identification - importance and indications for wrong polarity
21. Arc blow – definition, its effects.
22. Oxygen cylinder - Acetylene Cylinder.
23. Regulator types - construction, uses, care and maintenance.
24. Welding blow pipe – L. P. ,H. P.
25. Description and uses of cast Iron, Wrought Iron, Plain carbon steel.
26. Flash Back and Hack Fire.
27. Arc - Its Characteristics, Arc length. Advantages and Disadvantages

## PRACTICAL - I ( GAS WELDING )

WEEK NO.	PRACTICAL
1	Ex-1-Gas, Fusion run with and without filler Rod (2mm plate) position Flat)
2	Ex-2-Gas.Edge Joint with and without filler rod, (2mm) position Flat.
3	Ex-5-Gas. Outside corner joining m. s. plate (6,2,3,) thick
4	Ex-7-Gas Square Butt Joint M. S. plate 1,6,2 mm thick position Flat.
5	Ex – 9-Gas Fillet weld in horizontal position m. s. plate 1.6 mm, 2mm.
6	Ex – 11-Gas.Outside corner joint m. s. plate 2,3 mm thick horizontal position.
7	Ex-13-Gas Oxy-Acetylene Hand cutting straight 6,10 mm .
8	Ex-16-Gas. Fusion run with filler rod m. s. plate 2 mm. vertical position.
9	Ex-18-Gas .Out side corner joint m. s. plate 2 mm thick vertical position.
10	Ex-20-Gas.Square Butt Joint m. s. 1.6 mm to 3 mm thick vertical position .
11	Ex-21-Gas .Pipe Butt Joint m. s. pipe 50 mm, Flat Position.
12	Ex-23-Gas Fillet Lap and Tee Joint m. s. plate 2 mm. thick. Flat position.
13	Ex-25-Gas . Oxy-Acetylene hand cutting on m. s. plate 12 mm. Bevel cut. Straight cutting.
WEEK NO.	PRACTICAL - II ARC WELDING
1	Introduction Training :- Importance of Trade Training Machinery used in the trade, Type of work done by the trainees in the trade, types of hobs made by the trainees in the trade. Introduction to safety equipment and their uses etc. setting up of Arc and Gas plant. Lighting and adjustment of flame striking an Arc.
2	Ex- 2 -E Arc. Straight line bead on m.s. plate (10 mm Thick )position Flat..
3	Ex-4-E- Arc. Open corner joint m. s. plate 6,8,10 mm thick position Flat.
4	Ex-6-E-Arc.Fillet weld M.S. Plate 6,10,12 mm thick position flat.
5	Ex-8-E. Arc.Straight line Beads M. S. plate 8,10 12 mm thick Horizontal position.
6	Ex -10-Arc. Reinforcing pad Beads in Horizontal position M. S. plate 12 mm thick.
7	Ex-12-E-Arc.Butt weld in horizontal position 10, 12 mm thick.
8	Ex-14-E-Arc.Fillet weld in Horizontal Position m. s. plate 10,12 mm thick.
9	Ex-15-E-Arc.Bead weld vertical upward and down ward position m. s. plate 10,12, mm thick.
10	Ex-17-E-Arc. Fusion run with filler rod m. s. plate 12 mm. thick vertical position .
11	Ex-19-E-Arc.Out side corner joints m. s. 1.6 mm to 3 mm thick vertical position.
12	Ex-22-E-Arc Pipe Tee Joint '1 G' Position. m. s. pipe 50 mm.
13	Ex-24-Arc.Double Vee Butt Joint 12 mm. thick. Flat position.

**FOR THE TRADE OF WELDING AND JOINTING**

<b>Sr. No.</b>	<b>NAME OF TOOLS AND EQUIPMENTS</b>	<b>QUANTITY</b>
1.	Gloves pair leather	06
2.	Apron leather	04
3.	Screen welding helmet type	04
4.	Screen welding hand	04
5.	Goggles pair welder	05
6.	Chisel cold flat 19 mm	04
7.	Centre punch 9 mm X 127 mm	04
8.	Dividers 20 cm	04
9.	Caliper out side 15 cm	04
10.	Wire brush 15 cm X 3.7 cm	04
11.	Spark lighter	04
12.	Chipping screen hand	04
13.	Safety boots for welders	04
14.	Safety goggles	04
	<b>SHOP OUTFIT</b>	
15.	Steel Rule 12"	04 nos.
16.	Electronic Spark Lighter	02 nos.
17.	Square blade 15 cm	05
18.	Tongs holding 30 cm	05
19.	Hammer ball pen 1 kg with handle	05
20.	Chisel cold cross 9 mm	05
21.	Screw driver 25 cm blade & 20 cm blade	05
22.	Number punch 6 mm and letter punch 6 mm	02 each.
23.	Hacksaw Frame Fixed 30 cm	06 set.
24.	Magnifying glass 15 cm	02 nos.
25.	Weld measuring gauge fillet & butt	01 set.
26.	File half round bastard 30 cm	08 nos.
27.	File handle wooden	30 nos.
28.	File flat 25 cm rough	08 nos.
29.	Spanner D. E. 6mm, 15mm by 1.5 mm set of non 12 No's	02 set.
30.	Clamps "C" 10 cm , 15 cm, 20cm, 30 cm	02 nos.
31.	Hammer sledge double faced 0 kg	01 each.
32.	Pipe wrench 25 cm & 35 cm	01 each.
33.	Steel tape 500 cm flexible in case	04 nos.
34.	Tin mans square 60 cm X 30 cm	01 nos.
35.	Welding torches with 5 to 10. 2 H. P. Nozzles (all the assorted HPS) 2 . H.P. 1 . H.P.	02 set. 01 set.
36.	Pipe cutter (cap 50 mm dia)	01 no.
37.	Cutting torch oxy acetylene with cutting and gauging tips 1 (Nozzle mix type)	02 set.
38.	Electrode holder	04 nos.
39.	Welding rubber hose oxy & Acetylene 7 mm.	25 mtrs each
40.	Rubber hose clips	10 nos.
41.	Spindle key (for opening cylinder valve)	04 set.
42.	Pressure regulator oxygen.	06 nos.
43.	Pressure regulator acetylene	06 nos.
44.	Tip cleaner	04 nos.
45.	Glasses colored 108 mm X 82 mm E W- 11 original	08 nos.

46.	Glass white 108 X 82 mm	06 nos.
47.	Glasses colored 50 mm dia .	06 nos.
48.	Glasses clear 50 dia.	06 nos.
49.	Outfit spanner	02 nos.
50.	Rubber hose pipe black & red 4 mm	10 meters
51.	Leather sieves 58 cm	04 pairs
<b>GENERAL INSTALLATION</b>		
52.	Transformer welding 200-300 amps continuous welding current with all accessories.	02 set.
53.	Arc welding set rectifier type 200-300amps continuous welding current, with all accessories.	01 set.
54.	Welding generator AC/DC rotary set 200-300 amps with all accessories	01 set.
55.	Welding cables to carry 350 amps with flexible rubber.	25 meter.
56.	Lugs for cables	06 nos.
57.	Oxygen cutting machine (line & circle)	01 nos.
58.	Acetylene generator complete carbide to water.	01 nos.
59.	Gas welding table 822cm X 92cm 60 cm fire brick on stand with positioned.	01 nos.
60.	Arc welding table, all metal with positioned 122 cmX92cm X60 cm.	04 nos.
61.	Trolley for cylinders (H .P .unit).	01 nos.
62.	Bench shear hand capacity up to 12 mm.	01 nos.
63.	B. E. grinder 30 cm wheel motorized pedestal type.	01 nos.
64.	Elector dryuin goven - thematically controlled temperature 0.250 c 10 kg / cap	01 nos.
65.	150, Dia Disc Grinder portable 1 No (similar to wolf). 02 nos.	01 nos.
<b>GENERAL INSTALLATION</b>		
66.	Portable drilling machine (cap 10mm) similar to wolf.	01 nos.
67.	Fire extinguishers (form type & co2 type).	01 each.
68.	Instructors table (steel).	01 nos.
69.	Black board with easel	01 nos.
70.	Instructors chair (steel)	01 nos.
71.	First aid box	01 nos.
72.	Fire buckets with stand	02 nos.
73.	Steel Lockers with 24 pigeon holes	01 nos.
74.	Esab protex very IMP to flash Back protector for oxygen & Acetylene.	03 each.
75.	Hose connectors (oxygen & Acetylene).	03 each.
76.	Export system, for gas arc	01 each.
77.	Adjustable spanner 8” & 14”	02 each.

**Reference book :-**

Welding Theory –M.B.Dandagvhal

Workshop Tech. – Hajara & Chaudhari I & II

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