

1	Name of Syllabus	<b>C.C. IN WELDING AND JOINTING. (303107)</b>																																			
2	Max. No's 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 and Jointing 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 workshop . <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 personnel from industries																																			
10	Employment Opportunity	Self employment /employment																																			
11	Teacher's Qualification	ITI Welder with NCVT Passed & 2 years experience /MCVC in mech. Tech.																																			
12	Training System	<table><tr><th colspan="4">Training System Per Week</th></tr><tr><td>Theory</td><td>Practical</td><td colspan="2">Total</td><td colspan="3"></td></tr><tr><td>6 Hours</td><td>18 Hours</td><td colspan="2">24 Hours</td><td colspan="3"></td></tr></table>							Training System Per Week				Theory	Practical	Total					6 Hours	18 Hours	24 Hours															
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## THEORY PAPER –I, WELDING AND JOINTING

Importance of Trade Safety Precautions in Work shop to be observed while General Work.

Metal joining Process Knowledge about Welding Tools & Gauges. Various machines used in work shop other than Welding Machine.

Are Welding Equipment and accessories. Safety Precautions to be observed in Arc Welding.

Gas Welding equipments accessories and/safety Precautions. Types of Various Flame. Identification Characteristics and uses.

Chemistry of Flames Oxidation & Reduction. Welding terms & Defilations.

Various types of Joints Edge Preparation. Welding Symbols.

Welding position. Weld slope weld rotation. Theoretical information about Welding in various position.

Common Gases used in gas welding and Cutting. Oxy-fuel gas cutting. Heat and Temperature.

Calcium carbide, its characteristics & production of Acetylene gas.

Back fire and flash back. Flash back safety devices.

Example:-

- i) Hydraulic Back pressure Valve.
- ii) Hose protector.
- iii) Each protector.

Acetylene Purifies Regulators Construction and Functions of the Regulators.

Polarity their Importance Types of Arc length Primary Electricity.

Conduction, convection & Radiation.

Effect of atmosphere on welding Electrodes types of coating. Function of flux coating. Arc blow causes and Remedies.

Dissolve Acetylene Cylinder & Oxygen Cylinder, Manifold system Arc welding machine types Construction function, difference between each other.

Effects of on metal Metallurgy related to welding. (Heating And Cooling).

Low Pressure and High pressure Welding Blow pipe. Difference between welding and Cutting torches.

Arc Welding Defects gas Welding and Cutting Defects. Gauging Technique.

Welding Distortions Causes and its Remedies. Gas Welding Fluxes and filler rod

Heat Treatment, Pre-Heating. Post-Heating. Weld ability Effect of alloy on Weldability.

Welding testing inspections hard facing. Pipe welding positions and welding in various position of pipe.

Brief description of Modern Welding process. Eg. TIG, MIG, SAW, ETC.

Brief description of Modern Cutting process . Powder, cutting, laser cutting plasma etc, Soldering. Brazing and Braze welding.

Cast iron Gas welding arc welding. Braze welding, Aluminum welding by Gas and arc Brazing of Aluminum.

Gas and Arc welding. For stainless steel and copper. Casting and Economy in welding. Revision.

Examination.

## **PRACTICALS – I, WELDING JOINT**

### **SR NO**

- 1 Introduction of institute and section.
- 2 Use of various tools. Used in welding shop (Hammering Punching Hack Sawing-Filing etc.)
- 3 E-1 Assembly of Arc welding Plant Handling of Arc Welding Plant and Arc striking.
- 4 G-2 Assembling of Gas Welding Plant. Handling Of Gas Welding Plant, Flame igniting setting and Extinguishing.
- 5 Straight line De-position By Arc in Down Hand Position. E-3 (150mmX100mmX10mm)
- 6 G-4 : Fusion run with & without filler rod.(100X50X2mm).
- 7 E-5 :- Fillet –Tee-Joint by arc in Down Hand position. (150X50X10mm)
- 8 G-6 :- Edge Joint by Gas with and without filler rod. (150X50X1.6 mm).
- 9 G-7 :- Gas cutting in straight line. (200X100d10mm).
- 10 E-8 :- Open Corner joint by arc in Down Hand Position. Both Inside and Outside.
- 11 G-9 :- Square but Joint by Gas in Down Hand Position (150 X1.6 & 3mm).
- 12 E . 10 :- Single Vee but joint by Arc in Down (150X 50 X 10mm).
- 13 G -11 :- Open Corner Joint by gas in Down Hand position 1<sup>st</sup> Inside and than Outside. (150 X100X 3mm).
- 14 Fillet Tee Joint in Horizontal position by arc welding and padding on vertical surface of Tee E-12 (150X 50 X 10 mm).
- 15 E -13 :- Single Vee But Joint in Horizontal position.(200 X 50 X 10 mm).  
G-C-2 :- Bevel gas cutting on the above job.
- 16 E-14 :- Straight line deposition by arc in vertical position.(150 X 100 X 10mm) .
- 17 E -15 :- Lap and Tee Joint in vertical position. ( 150 X 50 x10mm).
- 18 G-16 :- Straight line deposition by Gas in vertical position. (150 X 100 X 2mm)
- 19 E- 17 :- Straight line deposition by arc in over head position.
- 20 G-18:- Square butt Joint in vertical position . G-19 :- Open Corner Joint in vertical position.
- 21 E-20 :- Fillet –Tee- Joint in Over-head position.

## **PRACTICALS - II JOB MAKING**

- 1 G-21 :- Pipe butt joint in 1- G position. E-22 :- Pipe butt Joint by arc in 1-G position.
- 2 G- 22 :- cast iron Gas welding and Brazing of broken job.
- 3 E-24 :- Project work for e.g. stool, table ,chair bench etc,
- 4 As above.
- 5 Examination.

## FOR THE TRADE OF WELDING AND JOINTING

Sr. No.	NAME OF TOOLS AND EQUIPMENDTS	QUANTITY
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

### SHOP OUTFIT

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 drover 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	10 nos.
27.	File handle wooden	30 nos.
28.	File flat 25 cm rough	10 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.	02 set.
	1 . H.P.	01 set.
36.	Pipe cutter (cap 50 mm dia)	01 no.
37.	Cutting torchy oxy acetylene with cutting and gauging tips 1 (Nozzle mix type)	02 set.
38.	Electrode holder	04 nos.

39.	Welding rubber hose ory & Acetylene 7 mm.	25 mtrs each
40.	Rubber hose clips	72 nos.
41.	Spindle key (for opening cylinder valve)	06 set.
42.	Pressure regulator oxygen.	06 nos.
43.	Pressure regulator acetylene	06 nos.
44.	Tip cleaner	10 nos.
45.	Glasses colored 108 mm X 82 mm E W- 11 original	24 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	10meters each
51.	Leather sieves 58 cm	04 pairs

### GENERAL INSTALLATION

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.

### GENERAL INSTALLATION

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 books :-**

- 1)Welding Theory :- Dandagavhal
- 2)Fitting Theory :- Dandagavhal
- 3) Welding and jointing :- Dandagavhal

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