GOVERNMENT OF TAMILNADU
DIRECTORATE OF TECHNICAL EDUCATION, CHENNAI
STATE PROJECT COORDINATION UNIT
(Established under Canada India Institutional Cooperation Project)
CURRICULUM

Course Name	**BASIC WELDING PRACTICES**
Course Code	ME/2020/026
Course Duration	150 Hours
Minimum Eligibility Criteria	8th Std
Pre-requisites (if any)	-
Course Objectives	Training module has been designed for the participants to • Understand various welding electrodes. • Understand Arc and gas welding processes. • Identify the different welding defects. • Appreciate the safety practices used in welding.
Course Outcomes	At the end of training, the participants will be able to • Perform Arc welding for different types of joints. • Perform Gas welding for different types of joints.
Expected Job Roles	• Arc welder • Gas welder

TEACHING AND SCHEME OF EXAMINATION						
Course Code	Course Name	Hours		Assessment Marks		Duration of the Examination
				Min	Max	
ME/2020/026	**BASIC WELDING PRACTICES**	Theory	60	10	20	3 hours
		Practical	90	40	80	
		Total	150	50	100	

ME/2020/026 - BASIC WELDING PRACTICES

DETAILED SYLLABUS

UNIT NO.	MODULES	No. of Hours	
		Theory	Practical
I	**Introduction**	**10 Hours**	
1.1	Classification of welding processes – practical application of welding – advantages and disadvantages of welding – welding as compared to riveting and casting.	5	
1.2	Welding electrodes – classification of electrodes – consumable electrodes and its types – coating ingredients and their function – manufacture of electrode – selection of electrode – care and storage of electrodes.	5	
II	**Arc Welding**	**90 Hours**	
2.1	Power sources for Arc welding – common tools used in welding – basic electricity as applied to welding – arc length and its effect –effect of variations in welding procedures on weldments during MMAW.	10	
2.2	Weld joint preparation – preheating – post heating – electrodes, types, specification, coating. Composition of flux – functions of flux – selection of electrodes – welding symbols – welding position.	10	
2.4	**Practical:** Straight line practice - Butt joint - Lab joint - T joint - Corner joint - T joint – Horizontal , Vertical , Overhead - Corner joint – Down hand , Horizontal , Vertical - Single V Butt joint – Down hand , Horizontal , Vertical - T joint all position.		70
III	**Gas welding**	**38 Hours**	
3.1	Classification – principle and operation of gas welding – chemistry of oxy acetylene flame – flashback and backfire – three types of flames – Gas welding equipments – welding techniques, leftward techniques, rightward techniques – fluxes – advantages disadvantages and applications of gas welding – soldering and brazing.	18	
3.2	**Practical:** St. line practice - Butt joint - Corner joint - T joint.		20

IV	**Defects in welding**	**5 Hours**	
4.1	Defects in welding – causes and remedies. Stress relief heat treatment of weldments. Inspection and testing of welded joints – destructive and Nondestructive test– magnetic particle test – dye penetrant test – radio graphic and ultrasonic test.	5	
V	**Safety in welding**	**7 Hours**	
5.1	Safety recommendations in arc welding– safety in installation and operation of arc welding equipment – explosion, fire and other hazards – protection of welder.	5	
5.2	Safety in installation and operation of gas welding equipments	2	
	Total Theory and Practical hours	**60**	**90**
	Total hours	**150**	

HARDWARE REQUIREMENT

S. NO.	LIST OF TOOLS / EQUIPMENTS
1	Arc welding unit & accessories
2	Gas welding unit & accessories

REFERENCE BOOKS

S. NO.	NAME OF THE BOOK	AUTHOR	PUBLISHER
01	Welding Technology	O.P.KHANNA	Dhanpat Raj Publishers, New Delhi
02	Welding Process and Technology	Dr.R.S.Parmar	Khanna Publishers, New Delhi
03	Welder Trade - Theory and Practice	--	NIMI, Chennai

ASSESSMENT AND CERTIFICATION

S. NO.	Criteria for Assessment
1.	A trainee will be assessed based on the performance in End Examination for Theory and Practical conducted internally in the Project Polytechnic College for a duration of 3 hours
2.	A trainee must have 75% of attendance to appear for End examination in Theory and Practical.
3.	The assessment for theory part will be based on the marks scored in the end examination on the knowledge bank of questions (1 word/objective type questions)
4.	The assessment for practical part will be based on the marks scored in the end examination conducted by the Project Polytechnic and assessed by the Examiners approved by Strategic Plan Implementation Committee (SPIC) of the project polytechnic.
5.	The passing criteria for successful completion of training is every trainee should score 50% of marks in theory and practical examination.
6.	On successful completion of training, Certificate will be issued to the participants by the Directorate of Technical Education through the Project Polytechnics.

END EXAMINATION

ALLOCATION OF MARKS

S.NO	Description	Max.Marks
1.	Theory Examination	20
2.	Practical Examination	
	a)Aim and Procedure	20
	b)Demonstration / Execution	25
	c) Result & Viva Voce	15
	d)Record	20
	Total Marks	**100**

THEORY MODEL QUESTION PAPER

ME/2020/026 – BASIC WELDING PRACTICES

(MAXIMUM MARKS: 20)

(N.B: Answer any **Twenty** questions) **20 x 1 = 20 Marks**

1. What is meant by welding?
2. Compare welding with Riveting.
3. List out the types of Consumable Electrodes.
4. List out any two functions of coating a electrode.
5. How to store an electrode?
6. How to select a power source in welding?
7. What will be the result, if the arc is too short in arc welding?
8. List out any two functions of flux.
9. List out the types of welded joints.
10. List out the characteristics used in arc welding DC machines.
11. Comparison of arc welding with gas welding.
12. What is the necessity of slag removal?
13. What is the purpose of back - hand welding?
14. List out the gases used in gas welding.
15. How do you differentiate oxygen cylinder and acetylene cylinder?
16. List out the types of flames?
17. What is meant by soldering?
18. When will be the weld crack occurs?
19. What are the causes for under cut?
20. What are the remedies for slag inclusion?
21. Why inspection is needed?
22. List out the types of non-destructive methods.
23. What is the best method to prevent accident?
24. List out any two safety recommendations in arc welding.
25. List out any two personal protective equipment.