

#179


SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY
SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: WELDING
Code No.: MET722-4
Program: STEAMFITTING APPRENTICE - INTERMEDIATE
Semester:
Date: AUGUST 1988
Author: GUNTER THOM

New: Revision XX

APPROVED:


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Date

Course Name**Course Number****PHILOSOPHY/GOALS**

This course is intended to provide basic instruction in the safe use of arc welding equipment.

METHODS OF ASSESSMENT (GRADING METHOD)

MARKING SYSTEM		
	1 Theory Test	30%
	Skill Evaluation	60%
A - 85+	Attendance/Attitude	10%
B - 75% - 84%	TOTAL	100%
C - 60% - 74%		
D - 50% - 59%		
F - Repeat		

Instructors should provide marks in percentages. A mark of "D" must be balanced with a "B" (in another subject if necessary) to obtain a passing grade of "C" - average.

Instructors should try for a class average of between 70 - 75%.

The instructor will determine which practical exercises will be used for grading.

TEXTBOOK(S) :

I.A.S. and notes.

Students should be given a copy of the course outline.

OBJECTIVES ;

The objectives are to provide the student with a basic knowledge of arc welding equipment, how to use it safely, and how to make fillet welds in the flat and horizontal positions.

The instructor must ensure that those apprentices who had been excused from taking the Basic course do learn the essentials of the material previously covered.

The student should realize that all objectives may not necessarily be reached due to time constraints.

SUMMARY - STEAMFITTING APPRENTICE - INTERMEDIATE

TOPIC NO.	PERIODS	TOPIC DESCRIPTION	REFERENCE
	T-THEORY L-LAB		
1a		Introduction to program. Scope of SMAW.	
	1/2T	Personal and shop safety.	SMAW I.A.S.#1
		Maintenance of shop and accessories.	
2a	1/2T	Types of welding machines.	SMAW
b		Current adjustments.	I.A.S.#2 Demo
	1/2T	Electrical principles.	SMAW I.A.S.#3
	29L	Welding practices.	SMAW I.A.S.#4 Demo
	1/2T	Selection of filler metals.	SMAW I.A.S.#5
		Welding terms and definitions.	SMAW I.A.S.#6
7	1/2T	Weld faults.	SMAW I.A.S.#7
8	1/2T	Written test	
TOTAL HRS.	3T, 29L	- 8 WEEKS	

TOPIC NO.	PERIODS	TOPIC DESCRIPTION	REFERENCE
	T-THEORY L-LAB		
1a	1/2T	Introduction to program. - objectives of course - assessment fimpo of <i>nrr</i> wnlldinq, - manual, saml-auLomatio, automatic proconnon Personal and shop safety* - clothing, gloves, helmet, lenses - electrical hazards - importance of electrical connections Maintenance of shop and accessories - - care of booth, positioners, table - clean-up - care of holder, helmets, gloves - electrode use and storage - material use and storage	SMAW I.A.S.fl
2a		Types of welding machines. - transformer - transformer/rectifier - generator - cost, maintenance of machines - advantages and disadvantages	SMAW I.A.S #2 Demo
	1/2T	Current adjustments. - coarse and fine adjustments - standard and remote - current and polarity - concept of polarity - quick disconnect couplers	
	1/2T	Electrical principles. - copy the face plate of a welding machine; input, output, phase - definition of ampere, volt, ohm, duty cycle, OCV	SMAW I.A.C.#3

TOPIC NO.	PERIODS	TOPIC DESCRIPTION	REFERENCE
	T-THEORY L-LAB		
	29L	<p>Welding practices.</p> <ul style="list-style-type: none"> - beads: 1/8 E6011; AC <ul style="list-style-type: none"> 1/8 E6013; AC 3/32 E7024; AC 1/8 E7018; DC+; AC - weaves (Pad): 1/4 plate 3" X 6" <ul style="list-style-type: none"> 1/8 E6011 <ul style="list-style-type: none"> 1 plate 1/8 E7024 <ul style="list-style-type: none"> 1/8 E7018 1 plate; both sides - fillet welds: IF; 1/4" plate <ul style="list-style-type: none"> i) - Rootpass 1/8 E6011 <ul style="list-style-type: none"> Remainder 5/31 E6011 ii) - Rootpass 1/8 E6010 <ul style="list-style-type: none"> Remainder 5/31 E6010 iii) - Rootpass 1/8 E7024 <ul style="list-style-type: none"> Remainder 1/8 E7024 iv) - Rootpass 1/8 E7018 <ul style="list-style-type: none"> Remainder 1/8E7018 v) - 2F; 3F, 4F, single pass and multipass welds for more advanced students - outside corner joints and butt joints in all positions 	SMAW I.A.S.#4
	1/2T	<p>Selection of filler metals.</p> <ul style="list-style-type: none"> - AWS; CSA classification - imperial and metric sizes - operating characteristics of E6010, E6011, E6013, E7024, E7018 - mechanical properties of above (5) rods 	SMAW I.A.S.#5

TOPIC NO.	PERIODS	TOPIC DESCRIPTION	REFERENCE
	T-THEORY L-LAB		
		Welding terms and definitions.	SMAW
		- fillet weld terms	I,A.S.#6
		- groove weld terms	
		- layers and passes	
		- weld sizes, shapes	
		- types of welds and joints	
	1/2T	Weld faults,	SMAW
		- overlap, undercut	I.A.S.#7
		- lack of fusion and penetration	
		- porosity, external and internal	
		- underbead cracking	
		- arc blow	
8	1/2T	Written test	
TOTAL HRS. 3T, 29L - 8 WEEKS			