

#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: 91W
Author: G. Thorn

DATE: 1991 01 04 PREVIOUS OUTLINE DATED: 1989 05 19

APPROVED: **S) -9*f^c** 
Dean, School of Technical Trades [%te /

WELDING

MET722-4

Course Name

Course Number

PHILQSOPHY/GOALS;

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

METHODS QE ASSESSMENT fGRAQWfi METHOD):**MARKING SYSTEM**

	1 Theory Test	-	30%
	Skill Evaluation	-	60%
A - 85+			
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^M" (in another subject if necessary) to obtain a passing grade of "C^H" - 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.	
b	1/2T	Personal and shop safety. Maintenance of shop and accessories.	SMAW I.A.S.#1
2a	1/2T	Types of welding machines.	SMAW
b		Current adjustments.	I.A.S.#2 Demo
3	1/2T	Electrical principles.	SMAW I.A.S.#3
4	29L	Welding practices.	SMAW I.A.S.#4 Demo
5	1/2T	Selection of filler metals.	SMAW I.A.S.#5
6		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	

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TOPIC NO.	PERIODS	TOPIC DESCRIPTION	REFERENCE
		T-THEORY	
		L-LAB	
1a	1/2T	<p>Introduction to program.</p> <ul style="list-style-type: none"> - objectives of course - assessment <p>Scope of arc welding.</p> <ul style="list-style-type: none"> - manual, semi-automatic, automatic processes <p>Personal and shop safety.</p> <ul style="list-style-type: none"> - clothing, gloves, helmet, lenses - electrical hazards - importance of electrical connections <p>Maintenance of shop and accessories.</p> <ul style="list-style-type: none"> - care of booth, positioners, table - clean-up - care of holder, helmets, gloves - electrode use and storage - material use and storage 	SMAW I.A.S.#1
2a		<p>Types of welding machines.</p> <ul style="list-style-type: none"> - transformer - transformer/rectifier - generator - cost, maintenance of machines - advantages and disadvantages 	SMAW I.A.S.#2 Demo
	1/2T	<p>Current adjustments.</p> <ul style="list-style-type: none"> - coarse and fine adjustments - standard and remote - current and polarity - concept of polarity - quick disconnect couplers 	
	1/2T	<p>Electrical principles.</p> <ul style="list-style-type: none"> - copy the face plate of a welding machine; input, output, phase - definition of ampere, volt, ohm, duty cycle, OCV 	SMAW I.A.S.#3

SUMMARY - STEAMFITTING APPRENTICE - INTERMEDIATE

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 1/8 E6013; AC 3/32 E7024; AC 1/8 E7018; DC+; AC <p>- weaves (Pad): 1/8 plate 3" X 6"</p> <ul style="list-style-type: none"> 1/8 E6011 <ul style="list-style-type: none"> - 1 plate 1/8 E7024 1/8 E7018 1 plate; both sides <p>- welding joint: 1F; 1/4" plate or 1/8 plate</p> <p>i) - edge joint E6013 - E7018</p> <p>ii) - lap joint E7018 - E7024</p> <p>iii) - outside corner E6011 - E7018</p> <p>iv) - butt joint E6011 - E7018</p> <p>v) - 2F; 3F, 4F, single pass and multipass welds for more advanced students</p> <p>- outside corner joints and butt joints in all positions</p>	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

SUMMARY - STEAMFITTING APPRENTICE - INTERMEDIATE

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