

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

WELDING

MET722-4

STEAMFITTING APPRENTICE - INTERMEDIATE

1987 07 09

GUNTER THOM

New:

Revision: XX

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 - Rep<*at		

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.

**t** **TEXTBOOK(S):**

I.A.S. and notes.

Students should be given a copy of the course outline

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**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.



TOPIC NO.	PERIODS	TOPIC DESCRIPTION	REFERENCE
		<b>T-THEORY</b>	
		<b>L-LAB</b>	
1a	1/2T	Introduction to program. - objectives of course - assessment  Scope of arc welding. - manual, semi-automatic, automatic processes  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 <b>I.A.S.t1</b>
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	
	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.S #3

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TOPIC NO,	PERIODS	TOPIC DESCRIPTION	REFERENCE
		<b>T-THEORY</b>	
		<b>L-LAB</b>	
	29L	<p>Welding practices.</p> <ul style="list-style-type: none"> <li>- beads: 1/8 E6011; AC 1/8 E6013? AC 3/32 E7024; AC 1/8 E7018; DC+; AC</li> <li>- weaves (Pad): 1/4 plate 3" X 6 1/8 E6011 1/8 E7024 1/8 E7018 1 plate; both sides</li> <li>- fillet welds: IF; 1/4" plate <ul style="list-style-type: none"> <li>i) - Rootpass 1/8 E6011 Remainder 5/31 E6011</li> <li>ii) - Rootpass' 1/8 E6010 Remainder 5/31 E6010</li> <li>iii) - Rootpass 1/8 E7024 Remainder 1/8 E7024</li> <li>iv) - Rootpass 1/8 E7018 Remainder 1/8E7018</li> <li>v) - 2F; 3F, 4F, single pass and multipass welds for more advanced students</li> </ul> </li> <li>- outside corner joints and butt joints in all positions</li> </ul>	<p>SMAW I.A.S.#4</p>
	1/2T	<p>Selection of filler metals.</p> <ul style="list-style-type: none"> <li>- AWS; CSA classification</li> <li>- imperial and metric sizes</li> <li>- operating characteristics of E6010<sub>f</sub>, E6011, E6013, E7024, E7018</li> <li>- mechanical properties of above (5) rods</li> </ul>	<p>SMAW I.A.S.#5</p>

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TOPIC NO.	PERIODS	TOPIC DESCRIPTION	REFERENCE
	<b>T-THEORY</b> <b>L-LAB</b>		
		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			

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