

#176

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

COURSE OUTLINE

COURSE TITLE: WELDING

CODE NO: MET721-3

SEMESTER: F90

PROGRAM: PLUMBING APPRENTICE - INTERMEDIATE

AUTHOR: GUNTER THOM

DATE: 1990-08-29

PREVIOUS OUTLINE DATED: 1989-05-19

Dean, School of Technical Trades

Date, ^/ 's~

COURSE NAME

WELDING

COURSE NUMBER:

MET721-3

**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**

A -- 85 +  
B -- 75% - 84%  
C -- 60% - 74%  
D -- 50% - 59%  
F -- Repeat

1 Theory Test	-	30%
Skill Evaluation	-	60%
Attendance/Attitude	-	10%
TOTAL	-	100%

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 - PLUMBING APPRENTICE - INTERMEDIATE

TOPIC NO.	PERIODS	TOPIC DESCRIPTION	REFERENCE
	T-THEORY L-LAB		
1a		Introduction to program. Scope of SHAW.	
b	1/2T	Personal and shop safety.	SMAW I.A.S.#1
c		Maintenance of shop and accessories.	
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
A	21L	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, 21L	- 8 WEEKS	

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TOPIC NO-	PERIODS	TOPIC DESCRIPTION	REFERENCE
	T-THEORY L-LAB		
1a	1/2T	Introduction to program. - objectives of course - assessment  Scope of arc welding. - manual, semi-automatic, automatic processes	
b		Personal and shop safety. - clothing, gloves, helmet, lenses - electrical hazards - importance of electrical connections	SMAW I.A.S.#1
c		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	
2a		Types of welding machines. - transformer - transformer/rectifier - generator - cost, maintenance of machines - advantages and disadvantages	SMAW I.A.S.#2 Demo
b	1/2T	Current adjustments. - coarse and fine adjustments - standard and remote - current and polarity - concept of polarity - quick disconnect couplers	
3	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
	T-THEORY L-LAB		
21L		Welding practices. - beads: 1/8 E6011; AC 1/8 E6013; AC 3/32 E7024; AC 1/8 E7018; DC+; AC - weaves (Pad): 3/8 plate 3" X 6" 1/8 E6011 1 plate 1/8 E7024 1/8 E7018   1 plate; both sides - velding joint: IF; 1/4" plate or 1/8 i) - edge joint E6013 - E7018 ii) - lap joint E7018 - E7024 iii) - outside corner E6011 - E7018 iv) - butt joint E6011 - E7018 v) - 2F; 3F, 4F, single pass and multipass welds for more advanced students	SMAW I.A.S.#4
1/2T		Selection of filler metals. - 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

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TOPIC NO.	PERIODS	TOPIC DESCRIPTION	REFERENCE
	T-THEORY L-LAB		
6		Welding terms and definitions. - fillet veld terras - groove veld terms - layers and passes - weld sizes, shapes - types of velds and joints	SMAW I.A.S.#6
7	1/2T	Weld faults. - overlap, undercut - lack of fusion and penetration - porosity, external and internal - underbead cracking - arc blow	SMAW I.A.S.I7
8	1/2T	Written test.	
TOTAL HRS. 3T, 21L - 8 WEEKS			