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#170

SAULT COLLEGE OF APPLIED ARTS *it* TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: **WELDING**

CODE NO.: **SEMESTER:** **W91**

PROGRAM: **INTERMEDIATE APPRENTICESHIP PROGRAMS**
INTRO TO BASIC SMAW WELDING

AUTHOR: **GUNTER THOM**

DATE: 1991-03-20 **PREVIOUS OUTLINE DATED: 1990-08-29**

APPROVED: Dean J.M. McCormack 9/^o3 ~^s
Dean, School of Technical Trades **Date**

WELDING FOR INTERMEDIATE APPRENTICES _____
Course Name Course Number

PHILOSOPHY/GQALS;

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

METHODS OF ASSESSMENT fQRADINQ METHOD);

MARKING SYSTEM

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

1 Theory Test	-	30%
Skill Evaluation	-	70%
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.

TEXTBOQK(S):

I.A.S. (Instruction Aid Sheets) 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, horizontal and vertical positions.

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

The student should realize that all objective may not necessarily be met due to time constraints.

SUMMARY - MVM APPRENTICE - INTERMEDIATE

TOPIC NO.	PERIODS	TOPIC DESCRIPTION	REFERENCE
	T-THEORY L-LAB		
la		Introduction to program. Scope of SMAW.	
b	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
3	1/2T	Electrical principles.	SMAW I.A.S.#3
4	13L	Welding practices.	SMAW I.A.S.#4 Demo
	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, 13L - 8 WEEKS

TOPIC NO.	PERIODS	TOPIC DESCRIPTION	REFERENCE
#			
		T-THEORY L-LAB	
la	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

TOPIC NO.	PERIODS	TOPIC DESCRIPTION	REFERENCE
#		T-THEORY L-LAB	
4	13L	Welding practices.	SMAW
a		- beads: 1/8 E6011; AC 1/8 E6013; AC 3/32 E7024; AC 1/8 E7018; DC+; AC	I.A.S.#4
b		- beads (Pad): 1/4 plate 3" X 6" 1/8 E6011 - flat position - 1 plate 1/8 E7024 - flat position 1/8 E7018 flat & horizontal	
c		i) - lap joint E7018 - E7024 fillet weld to size ii) - outside corner E6011 - E7018 iii) - tee joint; IF E7018 - E7024	
d		iv) - tee joint, horizontal and vertical single pass and multipass welds for more advanced students	
5	1/2T	Selection of filler metals. - AWS; CSA classification - imperial and metric sizes - operating characteristics of E6011, E6011, E6013, E7024, E7018 - mechanical properties of above rods	SMAW I.A.S.#5
6		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
7	1/2T	Weld faults. - overlap, undercut - lack of fusion and penetration - porosity, external and internal - underbead cracking - arc blow - prevention of distortion and weld procedures	SMAW I.A.S.#7
8	1/2T	Written test.	

TOTAL HRS. 3T, 13L - 8 WEEKS