

#169

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

COURSE OUTLINE

COURSE TITLE: **WELDING**


CODE NO

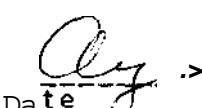
PROGRAM; **MVM-APPRENTICE BASIC**

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DATE: 1990-09-29 PREVIOUS OUTLINE DATED: 1989-05-23

APPROVE


Dean, School of Technical Trades

 ^{^/21} / 9'0
Date

COURSE NAME: WELDING

CODE NO;

PHILOSOPHY/GOALS;

This course of study provides students with a basic level of skills with emphasis placed on O.A. welding, safety and correct procedures

METHODS OF ASSESSMENT (GRADING METHOD)

MARKING SYSTEM	1 - Theory Test	30%
A - 85)^ +	Skill Evaluation	- ^^ -6^^
B - 75% - 84%	Attendance/Attitude)	^^^X
C - 60% - 74%	TOTAL	100%
D - 50% - 59%		
F - Repeat		

Instructors should provide marks in percentage. 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 marking.

TEXTBOOK(S);

I.A.S. and notes .
Students should be given a copy of the course outline.

OBJECTIVES;

The basic objective is to develop a student with safe work habits in the use of oxy-acetylene welding and cutting equipment. He will be introduced to non-fusion welding practices and to heat effects on metals.

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

SUMMARY - MVM APPRENTICE - BASIC

TOPIC NO.	PERIODS	TOPIC DESCRIPTION	REFERENCE
	T-THEORY L-LAB		
1a	1/2T	Orientation to program.	O.A.W.
b		Introduction and scope: fusion welding, non-fusion welding, cutting, heating.	I.A.S.#1
2a		Assembling and handling of equipment.	Demo/Note
b		Construction and storage of equipment.	
c		Repairs to accessories.	Demo
d		Types of oxy-actylene flames and fuel mixtures.	O.A.W.
e		Welding terms, positions, joints	I.A.S.#2 O.A.W.
f		Filler metals and their selection	I.A.S.#3
g		Weld faults.	Notes O.A.W.
3	5L	Fusion welding practices.	I.A.S.#4 Notes/Demo
4		Non-fusion welding practices	O.A.W.
a	4L	Braze welding.	I.A.S.#5
b	IL	Brazing	Notes/Demo
c	IL	Soldering	
	2L	Cutting practices	O.A.W. I.A.S.#6 Demo
<i>a.c Cc -tc</i>		Distortion of metals	O.A.W. I.A.S.#7 Demo
	1/2T,1L	Basic heat treatment of metals	O.A.W. I.A.S.#8 Demo
'.-&	1/2T	Written Test	
TOTALS	IT, 15L	- 8 WEEKS	

TOPIC NO.	PERIODS	TOPIC DESCRIPTION	REFERENCE
	T-THEORY L-LAB		
1a	1/2T	Orientation to program. <ul style="list-style-type: none"> - outline of topics to be covered - grading system: A,B,C,D,F. - method of evaluation - testing modes, dates - shop safety and regulations - personal safety - repair of shop equipment 	O.A.W. I.A.S.#1
b		Introduction to O.A.W. <ul style="list-style-type: none"> - Scope: fusion non-fusion cutting heating 	
2a		Assembling and handling of equipment. <ul style="list-style-type: none"> - assemble and disassemble hoses, regulators, torches, tips - identify and change "O" rings - adjust goggles, strikers - transport welding cylinders and cart 	Notes/Demo
b		Construction of equipment. <ul style="list-style-type: none"> - study cross-section of cylinders - location of safety devices - identification and marking of cylinders 	Notes/Demo
c		Repairs to accessories. <ul style="list-style-type: none"> - hose splicing, crimping tools, hose diameters 	Demo
d	1/2T	Types of O.A. flames and fuel mixtures. <ul style="list-style-type: none"> - lighting torches and adjustment - flame type and effect on weld puddle - characteristics and uses of other fuel gases: Mapp, natural gas, propane, air-acetylene - welding and cutting on containers - flashback and backfire 	O.A.W. I.A.S.#2 Notes/Demo

TOPIC NO.	PERIODS	TOPIC DESCRIPTION	REFERENCE
	T-THEORY L-LAB		
2e	1/2T	Welding terms, positions, joints. - 3 types of welds: bead, groove and fillet - explanation of face, root, throat of weld - 5 types of joints: butt, lap, tee, corner, edge - weld positions in respect to fillet welds - explanation of joint penetration and fusion	O.A.W. I.A.S.#3
f		Filler metals and their selection. - RG45, RG60 - tensile strength, ductility - weld soundness in respect to SI content	Notes
g		Weld faults: identification and prevention. - appearance, overlap, undercut. lack, of fusion, brittle welds, porosity, excessive convexity, concavity	O.A.W. I.A.S.#4 Notes
3	5L	Fusion welding practices, 16 gauge metal. - beads, no rod and with rod - edge joint without rod - outside corner joint, with rod - butt joint with rod - lap joint with rod	Notes/Demo
4a	4L	Non-fusion welding practices. - braze welding: definition, uses - advantages and disadvantages - braze weld tee-joint (both sides) 2F; 3F	I.A.S.#5 Notes/Demo
b	IL	- brazing, definition; uses - braze tee-joint 16 gauge metal using Allstate #45 i^R*45~)-. - safety: fumes, fluxes Soldering - definition; uses - fluxes - soldering equipment	v-

TOPIC NO.	PERIODS	TOPIC DESCRIPTION	REFERENCE
	T-THEORY L-LAB		
	IL	- solder steel to ste61 - solder wire connection	
5	2L	Cutting practices. - manual cutting, with and without guide bar - piercing - bolt cutting -cutabilityofmetals	O.A.W. I.A.S.#6 Demo
6	<i>J, ti^A</i>	Distortion of metals. - upsetting - heat input - neutral axis - heating for shrink fits	O.A.W. I.A.S.#7 Demo
7	<i>rjL^tc '-^</i>	Basic heat treatment for metals. - effect of heat on: grain size and microstructure	O.A.W. I.A.S.#8 Demo
a			
b	2L	- forging, hardening, tempering a cold chisel - case hardening	
-8 6:	1/2T	Written test.	