#175

SAULT COLLEGE OF APPLIED ARTS *it* TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: WELDJNfi.

CODE NO.: MEIS21 **SEMESTER:** Apprenticeship

PROGRAM: BASIC APPRENTICESHIP PROGRAMS
INTRO TO OXY-FUEL GAS WELDING & CUTTING

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DATE: 1994-04-27 **PREVIOUS OUTLINE DATED:** 1992-10-15

APPROVED: i). ?Y' ?<£ oS Ct/
Dean, School of Technical Trades Date

WELDING FOR BASIC APPRENTICES MET621

Course Name Course Number

TOTAL CREDIT HOURS: 24

I. PHILOSOPHY/GOALS:

This course will stress the proper set-up and handling of oxy-acetylene welding and cutting equipment. The student will become rasonably confident in his/her ability to produce acceptable results with fusion, non-fusion and flame cutting exercises.

II. STUDENT PERFORMANCE OBJECTIVES:

Upon successful completion of this course the student will:

. set up and operate oxy-acetylene welding and cutting equipment safely and correctly

. perform oxy-fuel welding and cutting opertaions with an acceptable degree of confidence and qualify

. produce fusion and non-fusion welds that demonstrate soundness by way of a 'fixed bend test'

III. TOPICS TO BE COVERED

1. Introduction/Orientation and Safety
2. Construction of Oxygen and Acetylene Cylinders
3. Assembling and Handling of Portable Equipment
4. Pressurizing and Operating the Welding Torch
5. Backfire, Burnback and Flashback
6. Types of Oxy-acetylene Flames and Fuel Mixtures
7. Fusion Welding Practices and Evaluation
8. Weld Faults and Causes
9. Non-Fusion Welding Practices and Evaluation
10. Filler Metals and their Selection
11. Flame Cutting Practices and Evaluation
12. Theory Test
13. Practical Test

Note: The instructor reserves the right to modify and/or change course topics in order to better serve the needs of the class

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IV. LEARNING ACTIVITIES	REQUIRED RESOURCES
Orientation to program. - outline of topics to be covered - method of evaluation - testing modes, dates - shop safety and regulations - personal safety - repair of shop equipment	I.A.S.#1
Introduction to O.A.W. - Scope: fusion non-fusion cutting heating	
Assembling and handling of equipment - assemble and disassemble hoses, regulators, torches, tips - identify and change "0" rings - adjust goggles, strikers - transport welding cylinders and cart	Notes/Demo.
Construction of equipment. - study cross-section of cylinders - location of safety devices - identification and marking of cylinders	Notes/Demo
Types of O.A. flames and fuel mixtures. - 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	I.A.S.#2 Notes/Demo
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	I.A.S.#3

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IV. LEARNING ACTIVITIES	REQUIRED RESOURCES
Filler metals and their selection. - RG45, RG60 - tensile strength, ductility - weld soundness in respect to SI content	Notes
Weld faults: identification and prevention. - appearance, overlap, undercut, lack of fusion, brittle welds, porosity, excessive convexity, concavity.	I.A.S.#4 Notes
Fusion welding practices, 16 gauge metal - beads, no rod and with rod - edge joint without rod - outside corner joint, with rod	Demo
Welding of small diameter pipe (1" dia: sch.40).}For Steamfitting **ONLY** - ASTM welding procedure	I.A.S.#5
Non-fusion welding practices. - braze welding: definition, uses - advantages and disadvantages - braze weld tee-joint(both sides) - braze tee-joint 16 gauge metal using Allstate #45 (RBAg-1)	I.A.S.#6 Notes/Demo
Cutting practices: scope. - manual straight fine cutting with and without guide bar - bevel cutting, mitre cutting - piercing - cutting of round stock; pipe, structural bar - gouging	O.A.W. I.A.S.#7
Written test.	

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V. EVALUATION METHODS: (INCLUDES ASSIGNMENTS, ATTENDANCE REQUIREMENTS ETC.)

A = 85 TO 100%	1 Theory Test	= 25%
B = 75 TO 84%	Skill Evaluation	= 75%
C = 60 TO 74%		
D = 50 TO 59%	Total	100%
F = 0 TO 49%		

VI. REQUIRED STUDENT RESOURCES:

a) Impact resistant safety glasses (CSA Approved)
b) Work Boots (Min. 6" top) (CSA Approved)
c) Work Clothes (coveralls recommended)
d) Basic Oxy-Acet. Welding Module (Approx. $8. Campus Store)
e) Notebook, paper, pens

VII. ADDITIONAL RESOURCE MATERIALS AVAILABLE IN COLLEGE LIBRARY

N/A

VIII. SPECIAL NOTES:

a) No re-writes on theory test
b) No remakes on practical test
c) Student is responsible to ensure all routine shop assignments have been handed in.
d) Students with special needs (eg. physical limitation, visual impairments, hearing impairments, learning disabilities) are encouraged to discuss required accommodations confidentially with the instructor