

*415

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO


COURSE OUTLINE

Course Title WELDING
Code No.: MET621
Program: MARINE & SMALL ENGINES -- BASIC
Semester:
Date: 1990 10 16
Author: Gunter Thom

New

Revision: XX

APPROVED:


Dean, School of Technical Trades

(X[^])
Date / *?0

WELDING

MET621

Course Name

Course Number

PHILOSOPHY/GOALS :

This course stresses safe handling of oxy-acetylene welding and cutting equipment. In addition to fusion and non-fusion welding practices, students will learn to set-up and practice welding of small diameter pipe.

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 - 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 grading.

TEXTBOOK (S) ;

I.A.S.(Instruction Aid Sheets) and notes.
Students should be given a copy of the course outline.

OBJECTIVES :

The basic objectives are that the student becomes proficient in cutting and joints. An understanding of welding principles as related to his trade.

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

SUMMARY ~ STEAMFITTING APPRENTICE - BASIC

| TOPIC NO. | PERIODS | TOPIC DESCRIPTION | REFERENCE |
|------------------------------|-------------------|--|------------------|
| | T-THEORY L-LAB | | |
| 1a | 1/2T | Orientation to program. | I.A.S.#1 |
| b | | Introduction to O.A.W. | |
| 2a | 1/2T | Assembling and handling of equipment. | Notes/Demo |
| b | | Construction of equipment. | Notes/Demo |
| c | | Repairs to accessories. | Demo |
| d | | Types of oxy-acetylene flames and fuel mixtures. | I.A.S.#2 |
| e | | Welding terms, positions, joints. | I.A.S.#3 |
| f | | Filler metals and their selection | Notes |
| g | | Weld faults, | I.A.S.I4 |
| 3 | 6L | Fusion welding practices of mild steel. | Demo |
| 4 | 1/2T,9L | Pipe welding. | I.A.S.#5 Demo |
| 5 | 4L | Non-fusion welding, | I.A.S.#6 Demo |
| 6 | 3L | Cutting. | I.A.S.#7 Demo |
| 7 | 1/2T | Written test. | |
| TOTAL HRS. 2T, 22L - 8 WEEKS | | | |

| TOPIC NO- | PERIODS | TOPIC DESCRIPTION | REFERENCE |
|-----------|-------------------|--|------------------------|
| | T-THEORY L-LAB | | |
| 1a | 1/2T | 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 |
| b | | Introduction to O.A.W. - Scope: fusion non-fusion cutting heating | |
| 2a | 1/2T | 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 |
| b | | Construction of equipment. - study cross-section of cylinders - location of safety devices - identification and marking of cylinders | Notes/Demo |
| c | | Repairs to accessories. - hose splicing, crimping tools, hose diameters | Demo |
| d | | 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 |

| TOPIC NO. | PERIODS | TOPIC DESCRIPTION | REFERENCE |
|-----------|-------------------|--|------------------------|
| | T-THEORY L-LAB | | |
| e | | 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 |
| 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. | I.A.S.#4 Notes |
| 3 | 6L | Fusion welding practices, 16 gauge metal. - beads, no rod and with rod - edge joint without rod - outside corner joint, with joint - butt joint with rod - lap joint with rod | Demo |
| 4 | 1/2T, 9L | Welding of small diameter pipe (1" dia: sen.40). - ASTM welding procedure | I.A.S.#5 |
| 5 | 4L | 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 (RB45) | I.A.S.#6 Notes/Demo |

| TOPIC NO- | PERIODS | TOPIC DESCRIPTION | REFERENCE |
|-----------|-------------------|---|--------------------|
| | T-THEORY L-LAB | | |
| 6 | 3L | Cutting practices: scope. - manual straight line 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 |
| 7 | 1/2T | Written test. | |
| 10 WEEKS | | | |