#443

A SAULT COLLEGE OF APPLIED ARTS *it* TECHNOLOGY

SAULT STE. MARIE, ONTARIO

# COURSE OUTLINE

COURSE TITLE: WELDING

CODE NO.

PROGRAM: **TRUCK/COACH - BASIC**

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DATE: 1991-01-04 PREVIOUS OUTLINE DATED: 1989-05-23

**APPROVED:** -^'^7^^'C^^^^-^^^^--^ X. 7X9 f

Dean, School of Technical Trades D^e 7

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COURSE NAME: WELDING CODE NO:

**PHILQSOPHY/QQALS:**

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

**METHODS *QI* ASSESSMENT IfiBAQIM 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 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.

**TEXTBOOKfS):**

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 - TRUCK/COACH APPRENTICE - BASIC

| TOPIC NO. | PERIODS | TOPIC DESCRIPTION | REFERENCE |
|---|---|---|---|
| | T-THEORY<br>L-LAB | | |
| la | 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.<br>I.A.S.#2 |
| | | Welding terms, positions, joints | O.A.W.<br>I.A.S.#3 |
| f | | Filler metals and their selecti | Notes |
| g | | Weld faults. | O.A.W.<br>I.A.S.#4 |
| 3 | 5L | Fusion welding practices. | Notes/Demo |
| 4 | | Non-fusion welding practices | O.A.W.<br>I.A.S.#5 |
| a | 4L | Braze welding. | Notes/Demo |
| b | IL | Brazing | |
| c | IL | Soldering | |
| 5 | 2L | Cutting practices. | O.A.W.<br>I.A.S.#6<br>Demo |
| 6 | 1/2T | Written Test | |
| TOTALS | IT, 15L - 8 WEEKS | | |

| TOPIC NO. | PERIODS | TOPIC DESCRIPTION | REFERENCE |
|---|---|---|---|
| | T-THEORY<br>L-LAB | | |
| Ia | 1/2T | Orientation to program.<br>- outline of topics to be covered<br>- grading system: A,B,C,D,F.<br>- method of evaluation<br>- testing modes, dates<br>- shop safety and regulations<br>- personal safety<br>- repair of shop equipment<br><br>Introduction to O.A.W.<br>- Scope: fusion<br>non-fusion<br>cutting<br>heating | O.A.W.<br>I.A.S.#1 |
| 2a | | Assembling and handling of equipment.<br>- assemble and disassemble hoses, regulators, torches, tips<br>- identify and change "0" rings<br>- adjust goggles, strikers<br>- transport welding cylinders and cart | Notes/Demo |
| | | Construction of equipment.<br>- study cross-section of cylinders<br>- location of safety devices<br>- identification and marking of cylinders | Notes/Demo |
| | | Repairs to accessories.<br>- hose splicing, crimping tools, hose diameters | Demo |
| | 1/2T | Types of O.A. flames and fuel mixtures.<br><br>- lighting torches and adjustment<br>- flame type and effect on weld puddle<br>- characteristics and uses of other fuel gases: Mapp, natural gas, propane, air-acetylene<br>- welding and cutting on containers<br>- flashback and backfire | O.A.W.<br>I.A.S.#2<br>Notes/Demo |

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| TOPIC NO. | PERIODS | TOPIC DESCRIPTION | REFERENCE |
|---|---|---|---|
| | **T-THEORY**<br>**L-LAB** | | |
| **2e** | 1/2T | Welding terms, positions, joints.<br>- 3 types of welds: bead, groove and fillet<br>- explanation of face, root, throat of weld<br>- 5 types of joints: butt, lap, tee, corner, edge<br>- weld positions in respect to fillet welds<br>- explanation of joint penetration and fusion | O.A.W.<br>I.A.S.#3 |
| | | Filler metals and their selection.<br>- RG45, RG60<br>- tensile strength, ductility<br>- weld soundness in respect to SI content | Notes |
| | | Weld faults: identification and prevention.<br>- appearance, overlap, undercut, lack of fusion, brittle welds, porosity, excessive convexity, concavity | O.A.W.<br>I.A.S.#4<br>Notes |
| | 5L | Fusion welding practices, 16 gauge metal.<br>- beads, no rod and with rod<br>- edge joint without rod<br>- outside corner joint, with rod<br>- butt joint with rod<br>- lap joint with rod | Notes/Demo |
| 4a | 41. | Non-fusion welding practices.<br>- braze welding: definition, uses<br>- advantages and disadvantages<br>- braze weld tee-joint (both sides) 2F; 3F | I.A.S.#5<br>Notes/Demo |
| | IL | - brazing, definition; uses<br>- braze tee-joint 16 gauge metal using Allstate #45<br>- safety: fumes, fluxes | |
| | | Soldering<br>- definition; uses<br>- fluxes<br>- soldering equipment | |

| | TOPIC NO. | PERIODS | TOPIC DESCRIPTION | REFERENCE |
|---|---|---|---|---|
| # | | T^THEORY<br>L-LAB | | |
| | | IL | - solder steel to steel<br>- solder wire connection | |
| | 5 | 2L | Cutting practices.<br>- manual cutting, with and without guide bar<br>- piercing<br>- bolt cutting<br>- cutability of metals | O.A.W.<br>I.A.S.^6<br>Demo |
| | 6 | 1/2T | Written test. | |