SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. **MARIE, ON**

COURSE OUTLINE

COURSE TITLE: WELDING

CODE NO.: Met721 / Met722 **SEMESTER:** N / A

PROGRAM: PLUMBING / STEAMFITTING - Intermediate

AUTHOR: **D** SOCCHIA

DATE: June 1996 **PREVIOUS OUTLINE DATED:** Jan 1995

DEAN **MSATE^**

TOTAL CREDITS **N / A**

PREREQUISITE(S): An apprenticeship in either the Plumbing or Steamfitting Trade plus the successful completion of the Basic of in-school training.

LENGTH OF COURSE: Plumbing Met721 = 3 Hrs per week for 8 weeks
Steam Fitting Met 722 = 4 Hrs per week for 8 weeks

TOTAL CREDIT HOURS: Plumbing Met721 = 24 hours
Steam Fitting Met722 = 32 hours

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PLUMBING/STEAMFITTING- Intermediate — Met721 /Met722

COURSE NAME — **CODE NO.**

I. COURSE DESCRIPTION: A curriculum that has been designed to provide a combination of theoretical knowledge and practical skill of the safe use and operation of typical Shielded Metal Arc welding equipment. It will include shop demonstrations and practical application of the above equipment in order to reinforce learning.

n. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:
(Generic Skills Learning Outcomes placement on the course outline will be determined and communicated at a later date.)

Upon successful completion of this course the student will demonstrate the ability to:

1) ***Communicate clearly and correctly in the written form as well as demonstrate by means of practical shop assignments a sound working knowledge of both personal and shop safety.***

Potential Elements of the Performance:

- identify proper eye, hand, face protection
- identify proper footwear and clothing
- locate and identify shop ventilation devices
- locate and identify emergency fire exits
- identify the location of shut-off valves for the shop gas manifold system
- explain procedures for evacuation of shop areas in case of emergency
- identify hazards associated with the Shielded Metal Arc Welding process

2) ***Communicate clearly and correctly in the written form as well as demonstrate by means of practical shop assignments / tests a sound working knowledge of how to set up and operate a typical SMA W workstation.***

Potential Elements of the Performance:

- identify, select and adjust welding helmets and filter lenses
- identify electrode according to type, size and AWS / CSA numbering system
- identify ASME / CSA standards for the storage and handling of electrodes
- identify guidelines for electrode selection and application
- identify techniques for adjusting both welding current and polarity
- perform a routine inspection of assigned workstations to determine the condition of power supply, cables, electrode holder and related equipment

IT, LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE (Continued)

- correct deficiencies prior to the commencement of work
- explain basic of SMAW joint designs and base metal edge / surface preparation
- describe techniques for arc ignition, setting electrode angle and travel speeds
- produce trial beads in the flat and horizontal positions
- identify possible weld defects and verify initial settings

3) *Communicate clearly and correctly in the written form as well as demonstrate by means of practical shop assignments / tests a sound working knowledge ofhmv to perform SMA Wprocedures and diagnose / correct defects.*

Potential Elements of the Performance:

- describe potential fire, fume and explosion hazards associated to SMAW
- perform appropriate adjustments to SMAW equipment specific to the demands of single and multi-pass fillet welds and vee groove welds
- describe and diagnose common weld defects
- perform destructive test on fillet welds to determine weld soundness
- identify and explain ASME and CSA acceptance standards for weld soundness
- identify and explain limited repair and service to electrode cables, holders, power sources and protective equipment
- perform destructive test on groove weld coupons in the 'as welded* condition (for Met722 ONLY !)

4. *Demonstrate by means of regular attendance, punctuality, respect for fellow students as well as lab /shop equipment, a willingness to assume the responsibilities of employment.*

Potential Elements of the Performance:

- be present for all scheduled classes
- be in the lab/shop or classroom within 5 minutes of the scheduled starting time
- be present for the taking of attendance
- provide a satisfactory reason to the professor for having to leave class early
- provide a reasonable excuse to the professor for being absent from class
- provide a written statement to the professor explaining the reason(s) for being absent on an assignment due date or the day of a scheduled test
- demonstrate behaviour that does not interfere with or obstruct the over-all

learning environment
- actively participate in all course assignments and projects
- operate any and all lab / shop equipment according to guidelines prescribed by the college and / or course professor

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

C.S.A. Approved (High Cut) Safety Work Boots
C.S.A. Approved (Impact Resistant) Safety Glasses
Appropriate Work Wear
Notebook c/w Paper
Two Finger (Gauntlet Type) Welding Gloves
Text: "New Lessons in Arc Welding"

V. EVALUATION PROCESS/GRADING SYSTEM

The evaluation for Learning Outcomes # 1 thru # 3 will consist of an over-all theory test as well as practical lab/shop assignments and tests for which students must demonstrate proficiency in both 'knowledge' and 'hands on' skill.

The over-all *theory test* will represent *30%* of the mark for the above Learning Tasks and will be ***'open book***[9] using Met721 / Met722 course notes and the identified text.

All ***practical lab / shop assignments and tests*** will represent *55%* of the mark for the above Learning Tasks and must be completed prior to the writing of the said theory test.

While all tests and assignments are designed to be completed with the specified time limit (or less), students MUST report to the shop/ classroom fully prepared. Your professor will supply only the assignment or test instructions.

The evaluation for Learning Outcome # 4 will consist of a day to day recording of the Elements of Performance listed. Each infraction will constitute the loss of one percentage point from the ***15 percentage points*** allocated to this outcome.