

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. OjfeMENT-SOCCHIA

DATE: June 1998 **PREVIOUS OUTLINE DATED:** June 1996

APPROVED: *H. Debi/ViAt^*
DEAN 0 **DATE**

TOTAL CREDITS N/A

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

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

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

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.

II. 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

1) *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) *Demonstrate by means of practical shop assignments /tests a sound working knowledge of how to set up and operate a typical SMAW 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

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

Communicate clearly and correctly in the written form as weU as demonstrate by means of practical shop assignments/tests a sound working knowledge of how 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 !)

Demonstrate a willingness to assume the responsibilities of employment.

Potential Elements of the Performance:

- be present for all scheduled classes
- 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

EL LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE
(Continued)

- 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
 - wear personal protective equipment at all times while in the shop
 - return all equipment and unused practice materials to their designated place upon completion of work
 - remove all scrap and thoroughly clean individual and / or assigned station

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: "Principles of Industrial 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 designated lab/shop assignments and tests for which students must demonstrate proficiency in both 'knowledge*' and 'hands on*' skill. Failure to complete all designated lab/shop assignments and tests shall result in the loss of the entire 10 % allocated to the "Employment Readiness" evaluation.

The over-all *theory test* will represent 35% of the mark for the above Learning Tasks and will be '*open book*' 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 die Elements of Performance listed. Each infraction will constitute the loss of one percentage point from the *10percentagepoints* allocated to this outcome.

| Course Grading Scheme | Final Mark (•» item \$ 3 «der Sp«*d Note) |
|-----------------------|---|
| A 85 - 100% | Shop Assignments / Tests 55% |
| B 75 - 84% | Theory Test 35% |
| C 60 - 74% | Employment Readiness 10% |
| D 50 - 59% | |
| F 0 - 49% | |

VL SPECIAL NOTES:

1. Special Needs

If you are a student with special needs (eg. physical limitations, visual impairments, hearing impairments, learning disabilities), you are encouraged to discuss required accommodations with the instructor and/or contact the Special Needs Office, Room E1204, Ext. 493,717,491 so that support services can be arranged for you.

2. Retention of Course Outlines

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other post-secondary institutions.

3. Student evaluations concerning the 'Final Mark*' are further affected by the conditions set forth in the printed handout, *Welding Department Guidelines*'. Be sure that you receive a copy of these guidelines.

4. Course materials that are discussed and / or explained during any and ail lab or shop demonstrations are subject to evaluation. Students are therefore responsible for the content of all lab / shop demonstrations.

Your Professor reserves the right to modify the course as he/she deems necessary to meet the needs of students.

Substitute Course Information is available at the Registrar's Office.

Any person caught cheating or substituting another person's work in place of their own for the purpose of grading or evaluation will automatically fail the said assignment or test. College policy* also dictates that such persons may be subject to immediate dismissal.

* Students should refer to the definition of "academic dishonesty" provided in the Sault College "Statement of Student Rights and Responsibilities".

VH. PRIOR LEARNING ASSESSMENT

Students who wish to apply for advanced credit in the course should consult the instructor. Credit for prior learning will be given upon successful completion of the following:

1. The successful completion of an arc welding course with Learning Outcomes and Elements of Performance that are at least 80% compatible with this course outline...

AND

2. The successful challenge of the over-all theory test identified by this course outline.

<OR>

3. Documented proof of at least three (3) years of competent trade experience involving both the use and operation of SMAW equipment that is compatible with Learning Outcomes described in Met721 / Met722...

AND

4. The successful challenge of the over-all theory test identified by this course outline.