SAULT COLLEGE of APPLIED ARTS and TECHNOLOGY
SAULT STE MARIE, ON

Sault College
Course Outline

Course Title WELDING

Course Code MET6210

Program Plumbing (Basic)

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Date Feb 2003 **Previous Outline Dated** June 1998

Approved _____ _____
Dean Date

Total Credits N / A

Prerequisites None

Length of Course 3 Weeks @ 8 Hrs / Week

Total Credit Hours N/A

I. COURSE DESCRIPTION: This curriculum is based upon the Welding Curriculum designed for Plumbing Apprentices and approved by the Ministry of Training, Colleges and Universities. No changes should be made to it without prior examination of the specific Learning Outcomes / Content of the Ministry document.

II. LEARNING OUTCOMES AND ELEMENTS OF PERFORMANCE

Upon successful completion of this course, clients will have been given the opportunity to :

1. Identify equipment and procedures required to assure personal safety while engaged in shop activities.

Potential Elements of Performance:

- identify proper work boots, gloves and eye protection
- identify recommended fabrics and materials for personal protective clothing
- understand the general organization and layout of the welding shop facility
- locate and identify shop lighting and ventilation controls
- locate and identify emergency exits
- identify and select proper shades of welding / cutting lens
- identify, select and adjust helmets for proper fit and vision
- understand procedures for evacuation of shop areas in the case of emergencies

2. Identify oxyacetylene cutting and cutting equipment and accessories including their construction, operation, assembly and disassembly.

Potential Elements of Performance:

- cylinders
    - identification
    - general construction
- pressure regulators
- manual valves
- manifold systems
- gages and hoses
- torch body
- tips
    - cutting
    - heating
    - welding
- cutting attachments
- flashback arrestors
- check equipment for safe operating condition

3. Identify, describe and demonstrate the theory of oxyacetylene cutting.

Potential Elements of Performance:

- set up equipment for oxyacetylene cutting
- select tip size and set cutting pressures for a given thickness of metal
- check equipment for safe operation
- pressurize, ignite, adjust and safely operate a cutting torch
- perform typical flame cutting operations to include
    - o square cut c/w re-start
    - o bevel cut c/w re-start
    - o piercing and making holes
- list and sketch five (5) joint designs for welded joints
- prepare plate edges for butt welding
- prepare pipe ends for butt welding

4. Demonstrate the ability to recognize weld faults and control distortion.

Potential Elements of Performance:

- name the factors that determine weld quality
- list the properties of a good weld
- identify and sketch three types of oxyacetylene welding flames
- name the factors that determine tip selection
- state the purpose of using a filler rod
- list the factors that determine filler rod selection
- state the cause and methods of control for welding faults
- state the cause and methods of control for distortion

5. Demonstrate the ability to deposit sound weld beads, tack welds and butt joints with filler rod in the flat position.

Potential Elements of Performance:

- set up equipment for oxyacetylene welding
- select tip size and set welding pressures for a given thickness of metal
- pressurize, ignite, adjust and safely operate a welding torch
- check equipment for safe operation
- deposit weld beads on mild steel plate with filler rod
- prepare butt joints to specification for welding
- tack weld joints to maintain alignment
- butt weld mild steel plate in the flat, horizontal and vertical position with filler rod
- butt weld a pipe joint in the horizontal fixed position

III. TOPICS

Clients may expect the following list of topics to be covered during this course of instruction.

1. Personal and shop safety
2. Oxy-acetylene welding and cutting equipment
3. Flame cutting practice and procedures
4. Fusion welding practice and procedure
5. Weld defects and distortion

IV REQUIRED STUDENT RESOURCES / TEXT and MATERIALS

CSA Approved (Impact Resistant) Safety Glasses
CSA Approved (8 inch High Cut) Safety Work Boots
CSA Approved (Gauntlet Type) Welding Gloves
Appropriate Work Wear (see Welding Shop Guidelines)
Pocket Note-pad (for Shop Demonstrations and Discussion)
Text: Principles of Industrial Welding

V. FINAL GRADE DETERMINATION

The final course grade will be determined by means of the following list of weighted factors:

Factor	***Weight***
Theory Test	30%
Shop Assignments	60%
Employment Readiness*	10%

* see page 2 of the printed handout 'Welding Department Guidelines"

VI. GRADING SYSTEM

The following system of grades will be used for Apprenticeship Training.

Grade	***Definition***
A+	95 - 100 %
A	85 - 94 %
B	75 - 84 %
C	60 - 74 %
D	50 - 59 %
F	0 - 49 %

VI. SPECIAL NEEDS

1. Special Needs: If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your instructor and/or the Special Needs office. Visit Room E1204 or call Extension 493, 717, or 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 postsecondary institutions.

3. Plagiarism: Students should refer to the definition of academic dishonesty in their Student Rights and Responsibilities manual. Students who engage in academic dishonesty will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

4. Course outline amendments: The Professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

5. Substitute course information is available in the Registrar's office.

VII. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult the professor. Credit for prior learning will only be given upon successful completion of a challenge exam or portfolio.

VIII. DIRECT CREDIT TRANSFERS:

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean’s secretary. Students will be required to provide a transcript and course outline related to the course in question.