

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY**

**SAULT STE. MARIE, ONTARIO**



Sault College

**COURSE OUTLINE**

**COURSE TITLE:** BASIC WELDING

**CODE NO. :** MET018/MET611                      **SEMESTER:** FALL

**PROGRAM:** MARINE & SMALL ENGINES

**AUTHOR:** D. BAIC

**DATE:** OCT. 2002      **PREVIOUS OUTLINE**                      OCT. 2001  
**DATED:**

**APPROVED:**

	_____	_____
	<b>DEAN</b>	<b>DATE</b>

**TOTAL CREDITS:** 2

**PREREQUISITE(S):**

**LENGTH OF COURSE:** 8 WEEKS                      **TOTAL CREDIT HOURS:** 16

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*For additional information, please contact P. Gibbons, Dean*  
*School of Apprenticeship & Trades*  
*(705) 759-2554, Ext. 656*

**I. COURSE DESCRIPTION:**

This curriculum that has been designed to provide sound theoretical knowledge for the safe use and operation of typical oxyacetylene welding, and cutting and heating equipment. It will include shop demonstrations and some practical application of the above equipment in order to reinforce learning.

**II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

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 location of shut-off valves for shop manifold gas system
- Explain procedures for evacuation of shop areas in case of emergency
- Describe the physical construction of both oxygen and acetylene cylinders
- Identify the built-in safety devices for both oxygen and acetylene cylinders
- Describe methods for identifying both oxygen and acetylene cylinders, hoses, regulators and fittings
- Identify basic physical properties and dangers associated with oxygen gas
- Identify basic physical properties and dangers associated with acetylene gas
- Describe procedures for cylinder handling
- Describe procedures for setting up, pressurizing, purging and shutting down a portable oxyacetylene station

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2. Communicate clearly and correctly in the written form, as well as demonstrate by means of practical shop assignments, a sound working knowledge of how to set up and operate a typical oxyacetylene workstation.

Potential Elements of the Performance:

- Perform a routine inspection of assigned workstations to determine the condition of torch body, hoses, regulators and tips.
- Correct deficiencies prior to the commencement of work
- Understand the differences in construction and operation between a balanced pressure and an injector torch
- Pressurize and purge regulators, hoses, torch body and tip
- Explain the dangers associated to the hazards of backfire and flashback
- Explain the correct safe response to backfire and flashback
- Explain the correct VS unsafe flame ignition procedures
- Adjust the oxyacetylene flame to produce flames designated as carburizing, neutral anozidizing
- Describe procedures for the shutting down of the oxyacetylene torch, regulators and assigned workstation

3. Communicate clearly and correctly in the written form, as well as demonstrate by means of practical shop assignments, a sound working knowledge of how to perform both fusion and braze welding operations.

Potential Elements of the Performance:

- Describe potential fire, fume and explosion hazards associated to the fusion welding of metals
- Identify proper fusion welding techniques
- Perform appropriate pressure setting and flame adjustments for specific fusion welding exercises
- Describe potential fire, fume and explosion hazards associated to the braze welding of metals
- Identify proper braze welding techniques
- Perform appropriate pressure settings and flame adjustments for specific braze welding exercises

4. Communicate clearly and correctly in the written form, as well as demonstrate by means of practical shop assignments, a sound working knowledge of how to perform flame cutting and heating operations.

Potential Elements of the Performance:

- Describe potential fire, fume and explosion hazards associated to the flame cutting of metals
- Identify proper flame cutting techniques
- Perform appropriate pressure settings and flame adjustment for specific flame cutting exercises
- Describe potential fire, fume and explosion hazards associated to the heating of metals
- Describe potential metallurgical changes that can occur as a result of the heating and cooling of metals
- Identify proper braze welding techniques
- Perform appropriate pressure settings and flame adjustments for specific heating exercises

5. 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 any classes
- Provide a written statement to the professor explaining the reasons(s) for being absent on an assignment due date or the date of a scheduled test
- Demonstrate behaviour that does not interfere with, or obstruct the overall 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

**III. TOPICS:**

1. Personal and Shop Safety
2. Oxyacetylene Welding
3. Fusion and Braze Welding
4. Flame Cutting and Heating Operations

**IV. REQUIRED RESOURCES/TEXTS/MATERIALS:**

CSA Approved (High Top) Safety Work Boots  
CSA Approved (Impact Resistant) Safety Glasses  
Welding Gloves  
Text: Principles of Industrial Welding

**V. EVALUATION PROCESS/GRADING SYSTEM:**

The evaluation for Learning Outcomes 1 through 4 will consist of an overall theory test, as well as practical lab/shop assignments for which students must demonstrate proficiency in both 'knowledge' and 'hands-on' training.

While all tests and assignments are designed to be completed within 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 Final Grade will consist of:

Practical Test	60%
Theory Test	30%
Employment Readiness	10%

The following course grading scheme will be assigned for final grades:

A	85 - 100%
B	75 - 84%
C	60 - 74%
D	50 - 59%
F	0 - 49%

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Code No.**VI. SPECIAL NOTES:**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.

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.

Plagiarism

Students should refer to the definition of “academic dishonesty” in *Student Rights and Responsibilities*. 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, as may be decided by the professor. 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.

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.

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 instructor. Credit for prior learning will be given upon successful completion of the following:

**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.